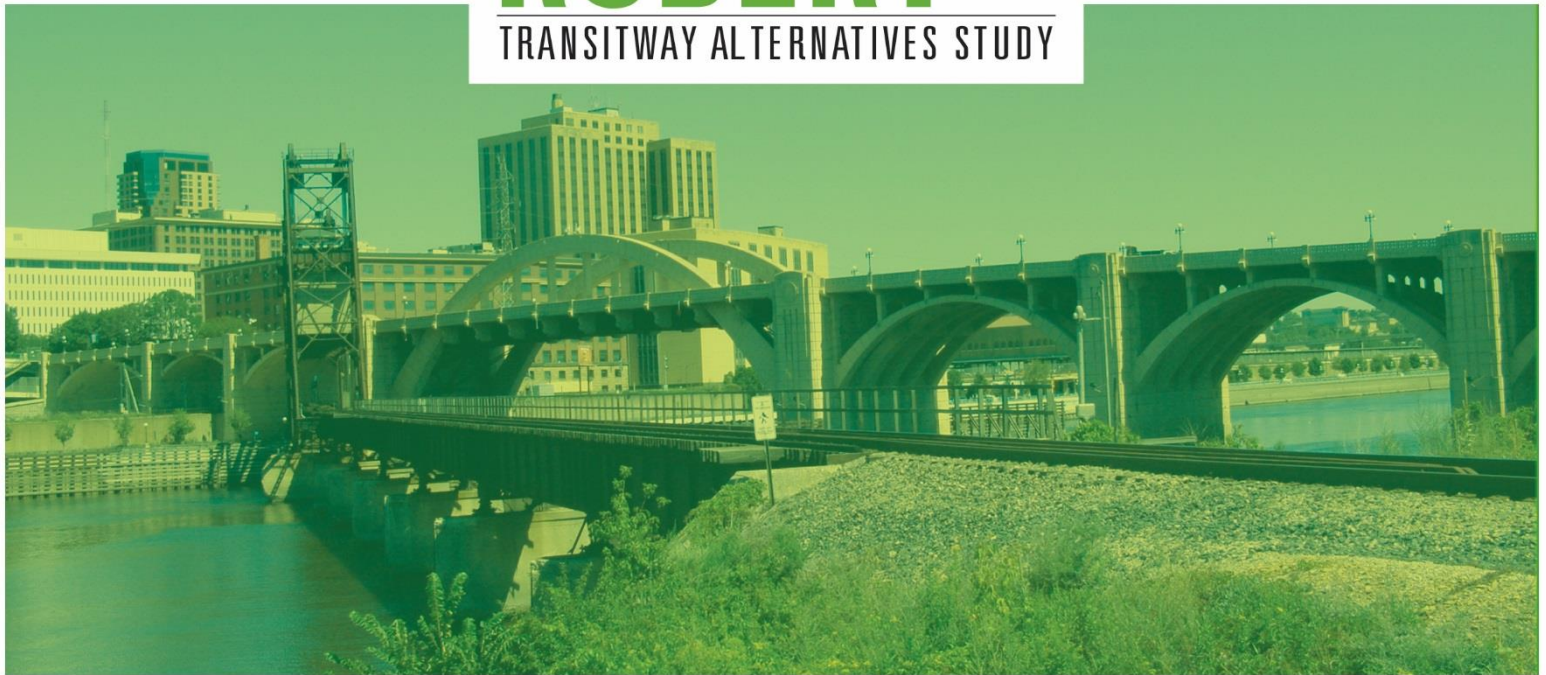


ROBERT ST

TRANSITWAY ALTERNATIVES STUDY



FINAL REPORT

October 2015

Prepared for:



Prepared by:



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Revision History

| Revision Number | Date | Description |
|-----------------|------------|---|
| 0 | 06/06/2014 | Initial draft to DCRRA and RCRRRA staff for comment |
| 1 | 04/09/2015 | DCRRA and RCRRRA staff comments incorporated; conclusion added; implementation figure added |
| 2 | 05/15/2015 | DCRRA, Metropolitan Council, and Metro Transit staff comments incorporated |
| 3 | 06/04/2015 | DCRRA revisions incorporated |
| 4 | 10/29/2015 | Resolutions of support incorporated |

List of Acronyms

| | |
|--------|--|
| AA | Alternatives Analysis |
| AGT | Automated Guideway Transit |
| APE | Area of Potential Effect |
| BRT | Bus Rapid Transit |
| CEI | Cost Effectiveness Index |
| CLUES | Comunidades Latina Unidos en Servicio |
| CMAQ | Congestion Mitigation Air Quality Improvement Program |
| CTIB | Counties Transit Improvement Board |
| DCRRA | Dakota County Regional Railroad Authority |
| EJ | Environmental Justice ¹ |
| FTA | Federal Transit Administration |
| HOT | High Occupancy Tolling (lanes) |
| IHCC | Inver Hills Community College |
| TIF | Tax Increment Financing |
| TIGER | Transportation Investment Generating Economic Recovery |
| LPA | Locally Preferred Alternative |
| LRT | Light Rail Transit |
| MAP-21 | Moving Ahead for Progress in the 21st Century |
| MVTA | Minnesota Valley Transit Authority |
| NSC | Northern Service Center |
| O&M | Operating and Maintenance |
| OMF | Operations and Maintenance Facility |
| PRT | Personal Rapid Transit |
| RCRRA | Ramsey County Regional Railroad Authority |
| ROW | Right-of-Way |
| STP | Surface Transportation Program |
| TAC | Technical Advisory Committee |
| TAZ | Transportation Analysis Zones |
| TH | Trunk Highway |
| TOD | Transit Oriented Development |
| TVM | Ticket Vending Machine |
| VMT | Vehicle Miles Traveled |

¹ Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. – Environmental Protection Agency

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List of Attachments

Technical Memos

- TM-1: Project Management Plan
- TM-2: Quality Management Plan
- TM-3: Public Participation Plan
- TM-4: Previous Studies Memorandum
- TM-5: Statement of Purpose and Need
- TM-6: Preliminary Screening and Evaluation Technical Memorandum
- TM-7: Alternatives Analysis Initiation Package
- TM-8: Conceptual Definition and Preliminary Evaluation of Alternatives
- TM-9: Travel Demand Forecasting Validation Report
- TM-10: Cost Estimation Technical Memorandum
- TM-11: Final Service Plan Technical Memorandum
- TM-12: Environmental and Social Considerations Technical Memorandum
- TM-13: Travel Demand Forecasting Technical Memorandum
- TM-14: Final Definition and Evaluation of Alternatives Technical Memorandum
- TM-15: Implementation Plan
- TM-16: Downtown Saint Paul Routing Concepts Technical Memorandum
- TM-17: Market Potential Memorandum
- TM-18: UMORE Park BRT Service Extension Sensitivity Analysis

Methodology Reports

- MR-1: Alternatives Evaluation Methodology Report
- MR-2: Cost Estimation Methodology Report
- MR-3: Economic Development and Land Use Assessment Methodology Report
- MR-4: Environmental and Natural Resources Assessment Methodology Report
- MR-5: Environmental Justice Methodology Report
- MR-6: Mobility Improvements Methodology Report
- MR-7: Traffic Operations Analysis Methodology Report
- MR-8: Travel Demand Forecasting Methodology Report

Outreach Materials and Meeting Minutes

- OM-1: Steering Committee Meeting Minutes
- OM-2: Technical Advisory Committee Meeting Minutes
- OM-3: Open House #1 Summary
- OM-4: Open House #2 Summary
- OM-5: Open House #3 Summary
- OM-6: Open House #4 Summary
- OM-7: Open House #5 Summary

Resolutions of Support and Public Comment Period

- RS-1: Resolutions of Support and Public Comment Period

1. Introduction

In 2012, the Dakota County Regional Railroad Authority (DCRRA) and Ramsey County Regional Railroad Authority (RCRRA) jointly initiated a Transitway Alternatives Analysis (AA) study of the Robert Street Corridor. The study was conducted under the Federal Transit Administration's (FTA) New Starts Program, which evaluates transit projects nationwide on eligibility for federal funding. This Final Report documents the overall process used and the conclusions reached over the two-year study period.

1.1. Study Purpose

The purpose of the Robert Street AA was to understand the major transportation patterns and needs within the defined study area in order to identify the ideal transit investments that could best accommodate present and future transit needs. The study was initiated in response to recent and expected changes within the study area including growth in population and employment, changes in demographics with respect to age, and increased overall travel volumes; all factors that drive the need for increased transit service levels and infrastructure.

Another major factor for initiating the AA involved the conclusions of Robert Street Corridor Transit Feasibility Study completed in 2008. This study outlined the existing and emerging transportation needs within the corridor, identified potential transit modes and alignments, and estimated the expected costs and benefits of various transit services. The study concluded that travelers within the study area were experiencing peak travel time delays on major arteries, transit service was only available to 2/3 of corridor residents, and absent further investment in transportation infrastructure, projections of growth in population and employment would lead to increased traffic congestion on local roads and highways. Following the Feasibility Study, Robert Street was included within the 2030 Transportation Policy Plan (TPP), adopted in 2010, as a potential transitway.

1.2. Study Area

The Robert Street AA study area ran north-south from the Union Depot in downtown St. Paul to Rosemount. The area was bound in the north by downtown St. Paul and continued to the south generally along the Mississippi River, I-35E, and Pilot Knob Road until and including the city limits of Rosemount. **Figure 1** shows the full study area. Incorporated cities within the study area included St. Paul, West St. Paul, South St. Paul, Sunfish Lake, Mendota Heights, Eagan, Inver Grove Heights, Lilydale, and Rosemount. Major highways within the study area included TH 3/Robert Street, TH 13, TH 55, TH 110, U.S. 52, Interstate 35E, and Interstate 494.

Development patterns in the study area ranged from urban in the north (downtown St. Paul) to inner-ring suburban, outer-ring suburban, and ultimately to nearly all rural in the southern parts of the study area. Land uses were primarily residential and commercial, with industrial uses lining the Mississippi River on the east side of the study area. Robert Street itself serves as a commercial and retail hub for much of the study area's length, containing a range of national retail chains and smaller local businesses and services. Additional retail hubs were also found in the study area, but are located on minor streets. Major points of interest include the Union Depot in St. Paul, Neighborhood House south of the Mississippi River, Thomson Reuters off TH 3 in

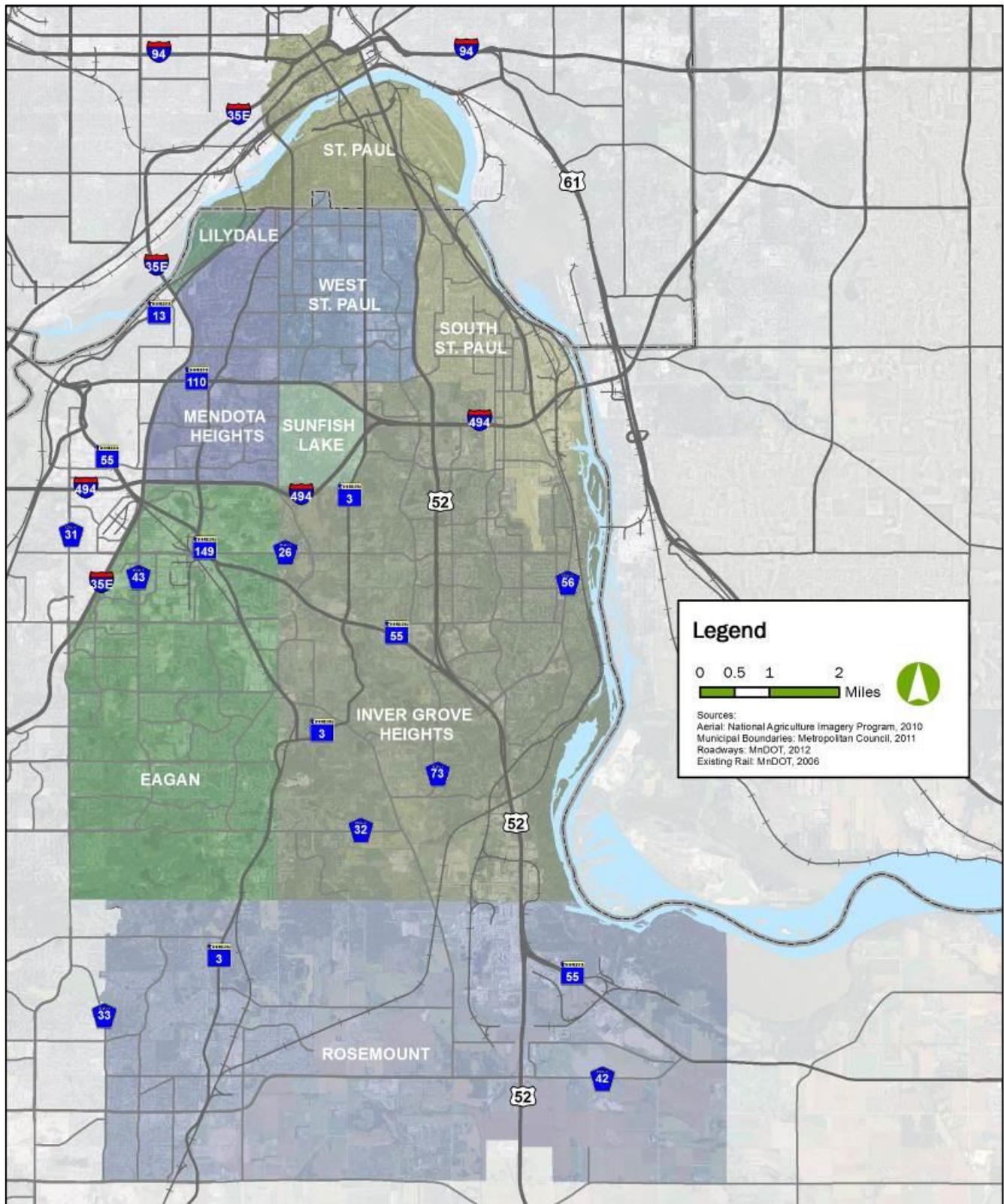


Figure 1 - Robert Street Transitway AA Study Area

Eagan, Inver Hills Community College off TH 52 in Inver Grove Heights, the Dakota County Technical College, and the future UMore Park to the south in Rosemount.

Existing local transit service within the study area is oriented primarily towards downtown St. Paul. Metro Transit provides local and express service to the northern and eastern part of the study area. Local service frequencies were generally 15-30 minutes in the peak hours, and 60 minutes during off-peak hours. The Minnesota Valley Transit Authority (MVTA) serves portions of Dakota County, including Eagan and Rosemount within the study area, with express routes to downtown Minneapolis and downtown St. Paul. The northern terminus of the study area includes Union Depot, which is served by Amtrak, local and intercity bus routes, Green Line Light Rail Transit (LRT), as well as other potential transitway service in the future.

1.3. Previously Completed Work

The AA recognized from the outset that previous transportation and land use studies had the potential to influence the provision of transit services within the study area. Accordingly, as an initial step in November of 2012, a summary of previously completed work was prepared for all stakeholders. The *Summary of Previously Completed Work* technical memorandum summarized the findings and recommendations of twenty-two (22) separate planning documents within the study area, and identified the specific ways in which the studies related to the Robert Street AA. **Table 1** on the following page identifies the full list of documents examined in preparation for the Alternative Analysis.

1.4. Study Overview

Using the Federal Transit Administration's (FTA) New Starts Program as a guide, the Robert Street Transitway Alternatives Analysis utilized a five-step process to go from project initiation to final evaluations:

- Step 1: Project Initiation and Methodology Identification** – Development of the Purpose and Need Statement, identification of evaluation framework and technical methodologies, and creation of the general roadmap to achieve the project purpose;
- Step 2: Project Scoping** – Initial public and stakeholder engagement to analyze the universe of transit alternatives;
- Step 3: Preliminary Screening** – Narrowing of all transit alternatives to those potentially worthy of further study;
- Step 4: Conceptual Definition and Preliminary Evaluation** – Analysis of remaining transit alternatives to identify those with the greatest likelihood of achieving the project purpose;
- Step 5: Advanced Definition and Final Evaluation** – Technical evaluation of remaining alternatives, optimization of options, and final comparative analysis.

During each step of the process, the project team and technical advisory committee (TAC) conducted in-depth analysis, which is documented within the twenty-four (24) companion memoranda and reports that make up the record for the Robert Street AA. This Final Report seeks to summarize the overall analysis and findings generated throughout the study. If additional detail is desired on any information presented in this Final Report, readers are encouraged to consult both the Methodology Report and Technical Memoranda specific to their area of inquiry (see **Section 1.5**). These individual reports and memoranda provide documentation of the in-depth analysis, data, and statistics that resulted in the information and findings contained herein.

Table 1 - Previous Studies Examined by the Summary of Previously Completed Work Technical Memorandum

| Study Name | Year | Jurisdiction |
|--|------|---|
| Dakota County 2030 Transportation Plan, Chapter 5 | 2012 | Dakota County |
| Regional Transitway Guidelines | 2012 | Metropolitan Council |
| The West Side Community Plan | 2012 | City of St. Paul |
| Robert Street Improvements Plan - Pedestrian Connectivity Study | 2011 | City of West St. Paul |
| Robert Street Improvements Plan - Grade Separated Trail Crossing Feasibility Study | 2011 | City of West St. Paul |
| Metro Transit Arterial Transitways Corridor Study | 2011 | Metro Transit |
| Comprehensive Plan - South St. Paul (Transportation Chapter) | 2011 | City of South St. Paul |
| Comprehensive Plan - Lilydale (Transportation Chapter) | 2011 | City of Lilydale |
| Planned Land Use - Sunfish Lake | 2011 | City of Sunfish Lake |
| Metropolitan Council 2030 Transportation Policy Plan | 2010 | Metropolitan Council |
| Comprehensive Plan - St. Paul (Transportation Chapter) | 2010 | City of St. Paul |
| Comprehensive Plan - Mendota Heights (Transportation Chapter) | 2010 | City of Mendota Heights |
| Comprehensive Plan - Eagan (Transportation Chapter) | 2010 | City of Eagan |
| Comprehensive Plan - Inver Grove Heights (Transportation Chapter) | 2010 | City of Inver Grove Heights |
| Lafayette S.P. 6244-30 T.H. 52 Future Light Rail Possibility Study | 2009 | MnDOT |
| Union Depot Environmental Assessment | 2009 | RCRRA, FHWA, MnDOT & FTA |
| Ramsey County 2030 Comprehensive Plan, Section B | 2009 | Ramsey County |
| Comprehensive Plan - West St. Paul (Transportation Chapter) | 2009 | City of West St. Paul |
| Comprehensive Plan - Rosemount (Transportation Chapter) | 2009 | City of Rosemount |
| Robert Street Corridor Transit Feasibility Study | 2008 | DCRRA |
| Dakota County North-South Corridor Eagan-Inver Grove Heights Travel Demand Study | 2007 | Dakota County, City of Eagan, City of Inver Grove Heights |
| Redevelopment Design Framework: A Strategy for South Robert Street's Renaissance | 2000 | City of West St. Paul |

1.5. Completed AA Documents

Completion of the AA was realized through the authoring of numerous documents throughout the planning process. The following is a complete listing of the study documentation that forms the backbone of this final report.

Table 2 - Completed AA Study Documents

| Study Component | Date Completed |
|---|----------------|
| Methodology Reports | |
| • Alternatives Evaluation Methodology | 12-18-2012 |
| • Economic Development and Land Use Methodology | 12-18-2012 |
| • Environmental and Natural Resources Methodology | 12-18-2012 |
| • Environmental Justice Methodology | 12-18-2012 |
| • Mobility Methodology | 12-18-2012 |
| • Traffic Operations Methodology | 12-18-2012 |
| • Travel Demand Forecasting Methodology | 12-18-2012 |
| • Cost Estimation Methodology | 11-15-2013 |
| Project Scoping Components | |
| • Public Involvement Plan | 08-21-2012 |
| • Open House #1 Summary | 10-05-2012 |
| • Previously Completed Studies Technical Memorandum | 11-29-2012 |
| Preliminary Screening Components | |
| • Preliminary Screening Technical Memorandum | 01-07-2013 |
| • AA Initiation Package | 02-14-2013 |
| • Open House #2 Summary | 05-02-2013 |
| • Purpose and Need Statement | 05-29-2013 |
| Conceptual Definition and Preliminary Evaluation Components | |
| • Conceptual Definition and Preliminary Evaluation Technical Memorandum | 09-16-2013 |
| • Open House #3 Summary | 11-15-2013 |
| Advanced Definition and Final Evaluation Components | |
| • UMore Park Sensitivity Analysis Technical Memorandum | 02-05-2014 |
| • Cost Estimation Technical Memorandum | 03-06-2014 |
| • Environmental and Social Considerations Technical Memorandum | 03-06-2014 |
| • Final Service Planning Technical Memorandum | 03-06-2014 |
| • Travel Demand Forecasting Technical Memorandum | 03-06-2014 |
| • Final Definition and Evaluation Technical Memorandum | 03-17-2014 |
| • Detailed Economic Development Analysis Technical Memorandum | 04-02-2014 |

2. Public Involvement

As one of the first components of the AA study, a public participation plan was adopted to ensure that all voices would be heard and that all activities would be conducted in accordance with Dakota County's *Strategic Communications Plan for the Robert Street Transitway Alternatives Analysis Study*.

2.1. Focal Points for Public Involvement

The DCRRA and the RCRRA were both heavily involved in the authoring of the public participation plan. The plan established the following goals to accomplish, objectives to achieve, and principles to uphold throughout the planning process.

2.1.1. Goals to Accomplish

- To ensure that information is made available to other agencies and the public through the duration of project studies, and that such information is as timely, clear and comprehensive as practicable
- To ensure that interested parties—including local governments and metropolitan, regional, state, and Federal agencies, as well as the general public—have an opportunity to participate in an open exchange of views throughout the analysis
- To make certain that outreach and engagement activities would meet or exceed federal and statewide requirements for stakeholder participation
- To be sure that County businesses become familiar with and support the options for the Robert Street Transitway
- To ensure that local elected officials will be supportive of development opportunities and economic growth along the Robert Street Transitway should a build alternative be selected
- To take all necessary steps to help local policy makers become familiar with and support the Robert Street Transitway as part of a regional transit system
- To provide sufficient information and evidence to allow environmental and other community groups to support the Robert Street Transitway

2.1.2. Objectives to Achieve

- Increased residential awareness of the Robert Street AA Study
- Educating County residents that development of the Robert Street Transitway could help slow congestion growth and provide transportation options
- Increased business and chamber of commerce understanding of the Robert Street AA Study and its benefits to slowing congestion growth, providing transportation options and promoting economic development
- Increased city council understanding of the Robert Street AA Study and its benefits to slowing congestion growth, providing transportation options and promoting economic development

- Increased awareness among residents, businesses, and local agencies that the Robert Street Transitway is an important part of the regional transit system under development
- Increased participation from traditionally underserved and underrepresented populations within the study area
- Ensuring that all impacted and potentially impacted stakeholders are engaged in the decision-making process for the Robert Street AA Study
- Confirming that all stakeholders, particularly underrepresented and unrepresented populations, will be informed and aware of how their input will be used
- Guaranteeing that work will coordinate with other studies to reduce confusion and manage expectations

2.1.3. *Principles to Uphold*

- Early and continuous participation of stakeholders
- Reasonable availability of technical and other project information
- Collaborative input on alternative transit improvements for the corridor and the criteria against which they will be measured and evaluated
- Open access to the decision-making process
- Proactive efforts to engage the public in the process, particularly those groups that are often underrepresented in public policy processes

Other main focal points of the public participation plan included the identification of key stakeholders, identifying existing issues and opportunities, outlining public participation techniques to be used, and asserting ways to reach under-represented populations.

2.2. **Project Committee Involvement**

A key element to the success of the public participation plan was continuous work with the project Steering Committee and Technical Advisory Committee as both groups were made up of representatives from local communities within the Robert Street study area and representatives from state and federal agencies (See **Table 3** and **Table 4**). Coordination with partnering agencies was largely handled through these meetings as all such agencies were represented on the committees, and each committee met approximately every two to three months throughout the course of the study. Additional meetings with individual agencies were held as needed to discuss and resolve issues as they arose.

Table 3 - Steering Committee Members

| Firm/Organization | Name |
|----------------------|--|
| Dakota County | Kathleen Gaylord (Co-Chair), Commissioner |
| | Thomas Egan, Commissioner |
| | Nancy Schouweiler, Commissioner |
| | Willis Branning, Commissioner |
| Ramsey County | Rafael Ortega (Co-Chair), Commissioner |
| | Tony Bennett, Commissioner |
| MnDOT | Wayne Norris |
| | Sheila Kauppi |
| | Lynne Bly |
| South Saint Paul | Lori Hansen |
| Rosemount | Bill Droste, Mayor |
| Inver Grove Heights | Dennis Madden, Councilmember |
| | George Tourville, Mayor |
| Mendota Heights | Sandra Krebsbach, Mayor |
| West Saint Paul | John Zanmiller, Mayor |
| Eagan | Meg Tilley, Councilmember |
| Sunfish Lake | Molly Park, Mayor |
| Metropolitan Council | Richard Kramer, Councilmember |
| | Steven Chavez, Councilmember |
| Saint Paul | Dave Thune, Councilmember |
| | Karen Reid, Neighborhood Development Alliance Executive Director |
| Project Team | |
| DCRRA | Joe Morneau |
| RCRRA | Josh Olson |
| Consultant Team | Brian Smalkoski |
| | William Reynolds |

Table 4 - Technical Advisory Committee Members

| Firm/Organization | Name |
|----------------------|-------------------|
| DARTS | Kevin Raun |
| MnDOT | Sheila Kauppi |
| | Molly McCartney |
| South St. Paul | John Sachi |
| Metro Transit | Charles Carlson |
| MVTA | Michael Abegg |
| | Jen Lehmann |
| Rosemount | Eric Zweber |
| Inver Grove Heights | Tom Link |
| Mendota Heights | Ryan Ruzek |
| West St. Paul | Matt Saam |
| | Matt Fulton |
| Eagan | Russ Matthys |
| Sunfish Lake | Molly Park |
| Metropolitan Council | Cole Hiniker |
| St. Paul | Allen Lovejoy |
| | Michelle Beaulieu |
| Project Team | |
| DCRRA | Joe Morneau |
| RCRRA | Josh Olson |
| Consultant Team | Brian Smalkoski |
| | William Reynolds |

Table 5 - Communications Matrix

| TOOLS USED | ELECTRONIC MEDIA | | | | MEDIA RELATIONS | | PRINTED MATERIALS | | | | EVENTS/MEETINGS | | | |
|--------------------------------------|------------------|-------------|----------------|--------------|-----------------|---------------|--------------------|----------------|---------|-------------------|--------------------|----------------------|---------------|--------------|
| | Project Website | Blast Email | Other Websites | Social Media | Blast Email | News Releases | Updates/Factsheets | Display Boards | Posters | County Newsletter | Public Open Houses | Stakeholder Meetings | Presentations | Local Events |
| Frequency | M | M | M | M | M | AN | BM | AN | AN | SA | SA | AN | AN | A |
| Residents / Owners | X | X | X | | X | | X | X | X | X | X | X | | X |
| Businesses, employees and customers | X | X | X | | X | | X | X | X | X | X | X | | X |
| Chambers of Commerce | X | X | X | | X | | X | X | X | X | X | X | X | |
| Neighborhood / Business Associations | X | X | X | | X | | X | X | X | X | X | X | X | |
| Social Service Organizations | X | X | X | | X | | X | X | X | X | X | X | | |
| Colleges, schools and bus services | X | X | X | | X | | X | | | X | X | X | | |
| City and county staff | X | X | X | | X | | X | | | X | X | X | | |
| Elected officials | X | X | X | | X | | X | | | X | X | X | X | |
| Commuters and traveling public | X | X | X | | X | | X | | | | X | | | X |
| TAC | X | X | X | | X | | X | | | | X | | X | |
| Steering Committee | X | X | X | | X | | X | | | | X | | X | |
| News media | X | X | X | | X | X | X | | | | X | | | |
| Emergency service providers | X | X | X | | X | | X | | | | | | | |
| Regulatory agencies | X | X | X | | X | | X | | | | | X | | |

A – Annual; AN – As Needed; BM – Bi-Monthly; M – Monthly; SA – Semi-Annually

Table 6 - Project Stakeholders

| Stakeholders | |
|--|---|
| Federal, State, Regional and County Agencies | |
| • Ramsey County (Districts 1 and 5, RCRRRA) | • Dakota Area Resources and Transportation for Seniors |
| • Dakota County (Districts 2, 3, 4, and 7, DCRRA) | • Minnesota Department of Transportation |
| • Metropolitan Council (Districts 13, 15 and 16) | • Federal Transit Administration |
| • Counties Transit Improvement Board | • Federal Highway Administration |
| • Metro Transit | • Regulatory Agencies (multiple) |
| • Minnesota Valley Transit Authority | |
| Corridor Communities | |
| • St. Paul (Planning Districts 3 & 17, and Council Ward 2) | • Mendota Heights |
| • West St. Paul | • Sunfish Lake |
| • South St. Paul | • Inver Grove Heights |
| • Lilydale | • Eagan |
| • Mendota | • Rosemount |
| Business Stakeholders | |
| • Dakota County Regional Chamber of Commerce | • Local chambers of commerce and business associations |
| • St. Paul Area Chamber of Commerce | • Individual businesses |
| • Hispanic Chamber of Commerce | • Major employers |
| • River Heights Chamber of Commerce | • Large commercial property owners |
| • Visit St. Paul | • Commercial and residential developers |
| • Health providers | |
| Educational Institutions | |
| • Dakota County Technical College (Rosemount) | • Northwest Technical Institute (Eagan) |
| • Inver Hills Community College (Inver Grove Heights) | • Brown College (Mendota Heights) |
| • Saint Paul Technical College (St. Paul) | • McNally Smith College of Music (St. Paul) |
| • Argosy University (Eagan) | • School Districts |
| Public Stakeholders | |
| • Property owners | • Students |
| • Residents (owners and renters) | • Neighborhood organizations and district councils |
| • Businesses (property owners and leaseholds) | • Senior housing developments |
| • Commuters and traveling public | • Early Childhood and Family Education Groups |
| • Under-represented and under-served populations such as low income families and non-English speaking people | • Cultural and ethnic groups [i.e. Comunidades Latina Unidos en Servicio (CLUES), Chicano Latino Affairs Council, Lao Family Community of Minnesota, etc] |
| Other Stakeholders | |
| • Social Service Providers | • Faith-based groups: churches, Isaiah |
| • Non-profit organizations | • Emergency service providers |
| • Advocacy groups | |

2.3. Summary of Public Involvement

The public participation report outlines in detail the extensive public outreach that was completed as part of the AA study. In summary, five (5) public open houses and over thirty (30) individual meetings with neighborhood and business organizations, advocacy groups, and under-represented populations ensured a high-level of public input throughout the decision making process.

3. Project Purpose and Need

A project purpose statement defines the fundamental reasons why a project is proposed. It is especially important within an AA process because it shapes the study alignment options based upon fulfillment of the defined project purpose.

3.1. Project Purpose

The following statement is the purpose of the Robert Street Transitway project as defined by the project team and project advisory committees with public input from project open houses.

"The purpose of the Robert Street Transitway is to provide the necessary transit infrastructure and service to meet the long-term regional mobility and local accessibility needs between downtown St. Paul and north central Dakota County."

3.2. Project Needs

This section outlines the foundation for the statement of the project purpose defined in **Section 3.1**. Project needs are those problems that the Robert Street Transitway project must address.

Transportation problems in the study area range in level of severity and imminence. All are important, and together they substantiate the demand for this project. Five primary factors contribute to the need for the Robert Street Transitway project:

- Forecasted growth in travel demand resulting from continued growth in population and employment
- Limited transit service and time-efficient transit options
- Needs of people who depend on transit
- Roadway congestion and shift toward multimodal investments
- Regional objectives for growth

3.2.1. Forecasted Growth in Travel Demand

Data examined to begin the study showed the greater Twin Cities region continues to expand, and Dakota County and parts of St. Paul are at the forefront of this trend. Both population and job projections indicated that Dakota County will be growing at a rate faster than the regional average between 2010 and 2030. Additionally, the Lowertown neighborhood in downtown St. Paul (within the study area) is one of the region's fastest growing neighborhoods. Taken together, the identified growth is expected to result in growing travel demand.

As shown in **Table 7**, population in the project area is forecast to grow by 29 percent between 2010 and 2030. Over that same time, employment within the study area is expected to grow by 34 percent, and densities are increasing in portions of the study area. The area south of Interstate 494 accounts for a significant portion of these increases, and is forecast to grow at rates greater than the region as a whole.

Increased growth is also expected for the city of St. Paul, especially within the Robert Street study area. After experiencing a population decrease in 2000-2010, the city is forecast to grow by 16 percent between 2010 and 2030. Growth within the St. Paul study area neighborhoods is projected to outpace growth within the city as a whole, with population increasing by 41 percent between 2010 and 2030.

Table 7 - Population and Employment Changes/Forecasts within the Robert Street Transitway Study Area²

| Area | POPULATION | | | EMPLOYMENT | | |
|--|------------------|------------------|----------------------------|------------------|------------------|----------------------------|
| | 2010 | 2030 | % Change 2010 - 2030 | 2010 | 2030 | % Change 2010 - 2030 |
| St. Paul* | 285,068 | 331,000 | 16% | 175,933 | 220,600 | 25% |
| <i>St. Paul (study area)**</i> | <i>47,363</i> | <i>66,725</i> | <i>41%</i> | <i>95,262</i> | <i>125,807</i> | <i>32%</i> |
| First Ring Suburbs (Lilydale Mendota Heights, S. St. Paul, Sunfish Lake, W. St. Paul) | 51,915 | 55,830 | 8% | 27,941 | 32,350 | 16% |
| Second and Third Ring Suburbs (Eagan, Inver Grove Heights, Rosemount) | 119,960 | 160,100 | 33% | 65,689 | 95,800 | 46% |
| Project Area Total*** | 219,238 | 282,655 | 29% | 188,892 | 253,957 | 34% |
| Twin Cities Metropolitan Area | 2,849,567 | 3,608,000 | 27% | 1,544,613 | 2,126,000 | 38% |

* Data is for full city, but area does not fall fully within the study area.

** St. Paul (study area) is an approximation derived from TAZs selected in GIS. Data is not available for year 1990.

*** St. Paul (study area) approximation was used for this calculation.

This growth in population and employment in the study area and beyond is expected to result in growing travel demand. As illustrated in **Figure 2** which shows population density by transportation analysis zone (TAZ), population densities are forecast to increase in selected areas in six of the nine study area communities—St. Paul, West St. Paul, South St. Paul, Inver Grove Heights, and Rosemount. Similarly, **Figure 3** shows that employment densities are forecast to increase in selected areas in four of the study area communities—St. Paul, West St. Paul, Inver Grove Heights, and Eagan.

² Metropolitan Council, 2010

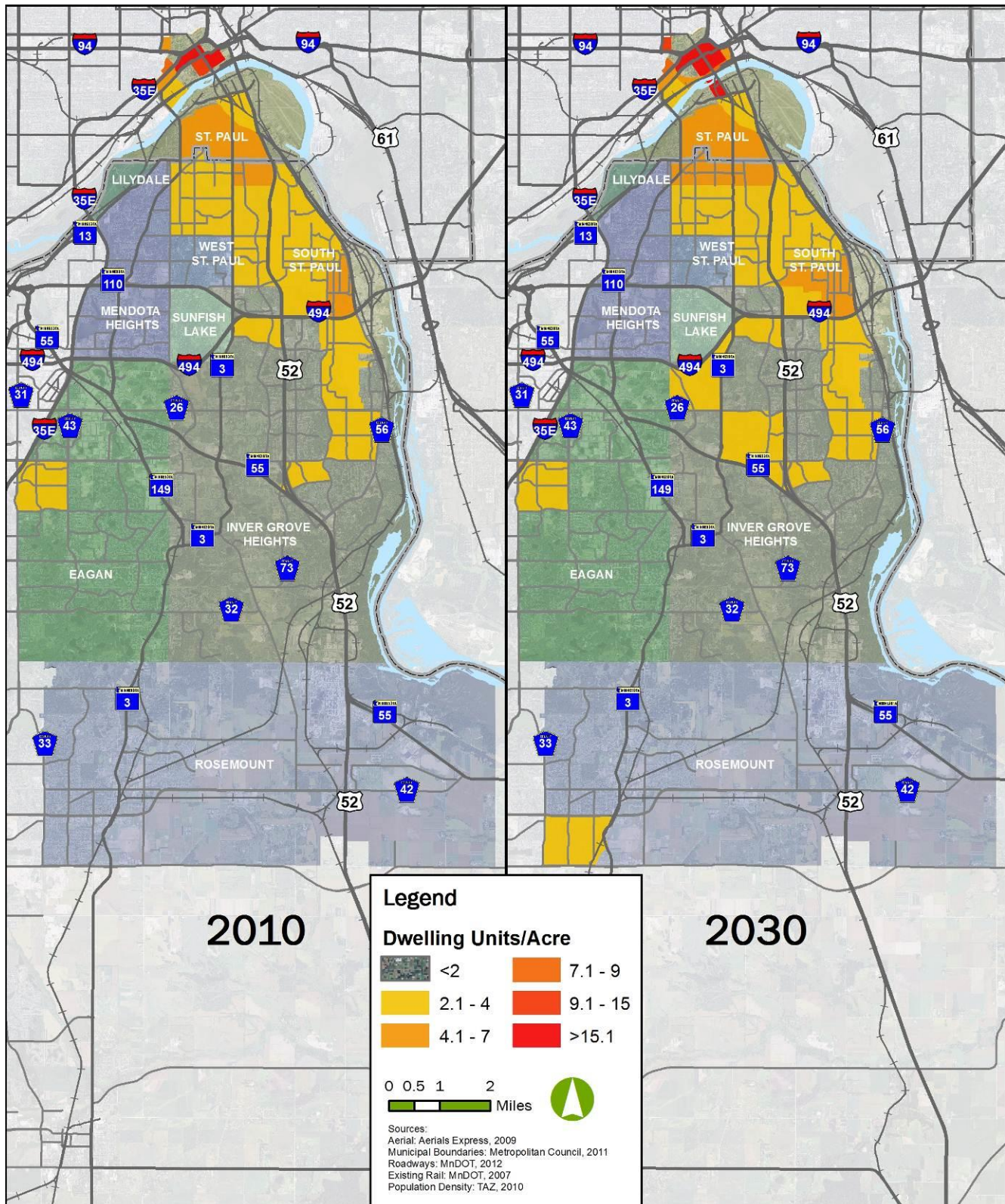


Figure 2 - Current and Future Population Density

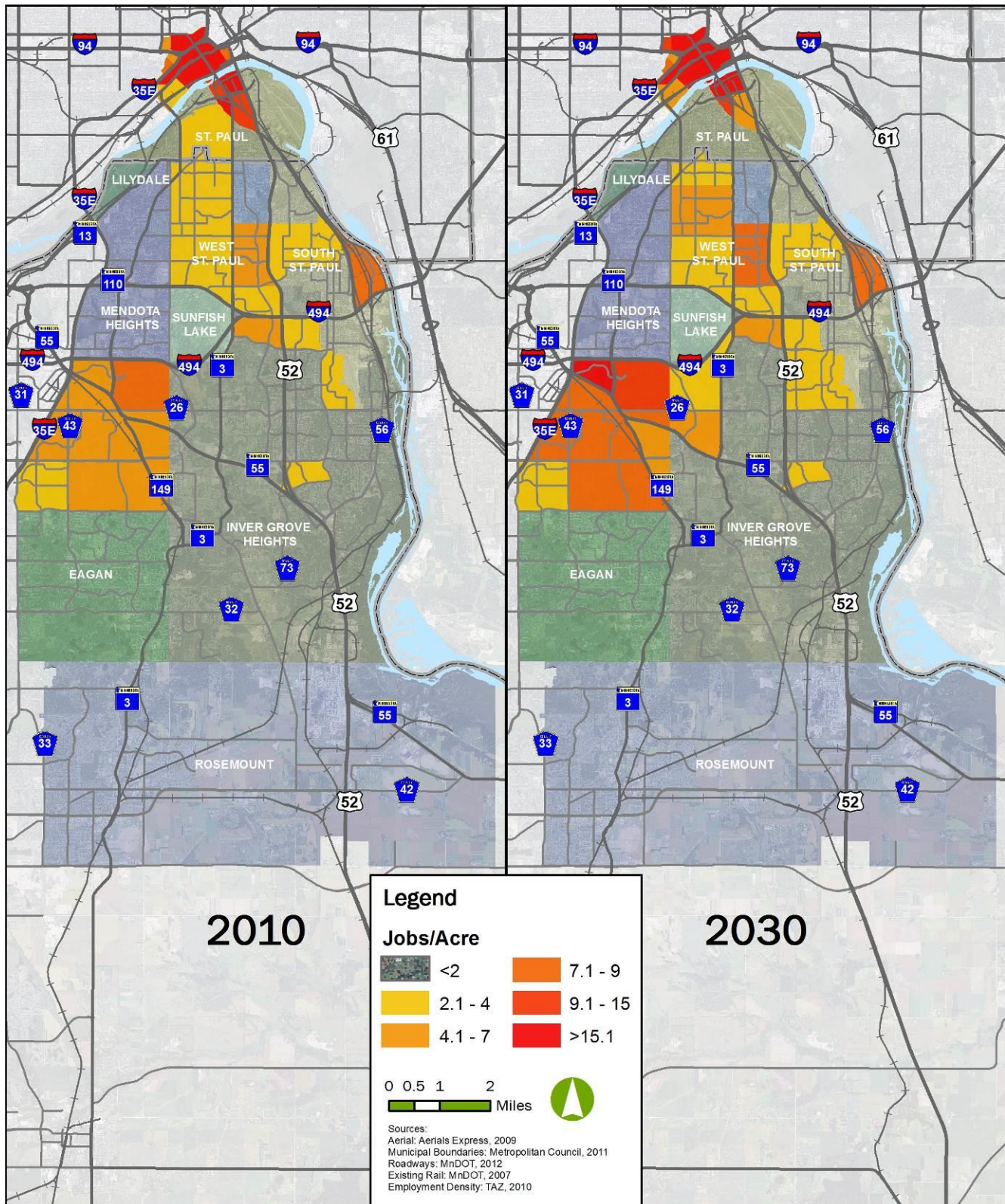


Figure 3 - Current and Future Population Density

3.2.2. *Limited Transit Service and Time-Efficient Travel Options*

Existing transit service within the study area was found to be limited in terms of frequency and availability, limiting both local and regional transit mobility. As the central business district in the state's capital city, downtown St. Paul serves as a key access point to the Twin Cities regional transit system. The Union Depot multimodal transportation hub in downtown St. Paul was renovated to provide connections to the Green Line LRT and the regional transitway system, Amtrak passenger rail to Chicago and the Pacific Northwest, intercity and regional buses, local bus service, and bicycle and pedestrian facilities. Residents, employees and other potential transit users in Dakota County need a reliable and time-competitive travel option to access these connections in downtown St. Paul.

As of October 2012, seventeen (17) fixed-service bus routes served the Robert Street Transitway study area. Of these seventeen (17) routes, high frequency service (15 minute headways or better) is provided along a portion of only one (1) route (the portion of Route 68 serving Robert Street north of Thompson Avenue) and only during the peak period. This route is not included in Metro Transit's "hi-frequency" network, which is a designation for routes that provide all-day 15-minute service (or better) six days a week. Seven (7) of the seventeen (17) routes provide express service only, and only operate during peak hours. These routes typically have ten (10) or fewer trips per day and operate at 30- and 60-minute frequencies.

Figure 4 provides a map of routes transit routes denoted by type: express, local, or high-frequency. The figure also illustrates several other characteristics of the existing transit service in the study area:

- Little to no service is provided in the southern third of the study area, which reflects the generally lower population density at the southern end of the corridor
- The local routes typically provide a circuitous (and therefore longer duration) trip than the express routes due to the need to serve multiple destinations with limited resources
- There is no express service in the central or eastern portions of the study area, only in the western portion (I-35E)
- Currently there is no transit service to the southeastern and south central portions of the study area, which includes Dakota County Technical College and the envisioned U-More Park development

Figure 5 further illustrates the absence of a time-competitive travel option into downtown St. Paul by illustrating transit travel times on existing transit routes.

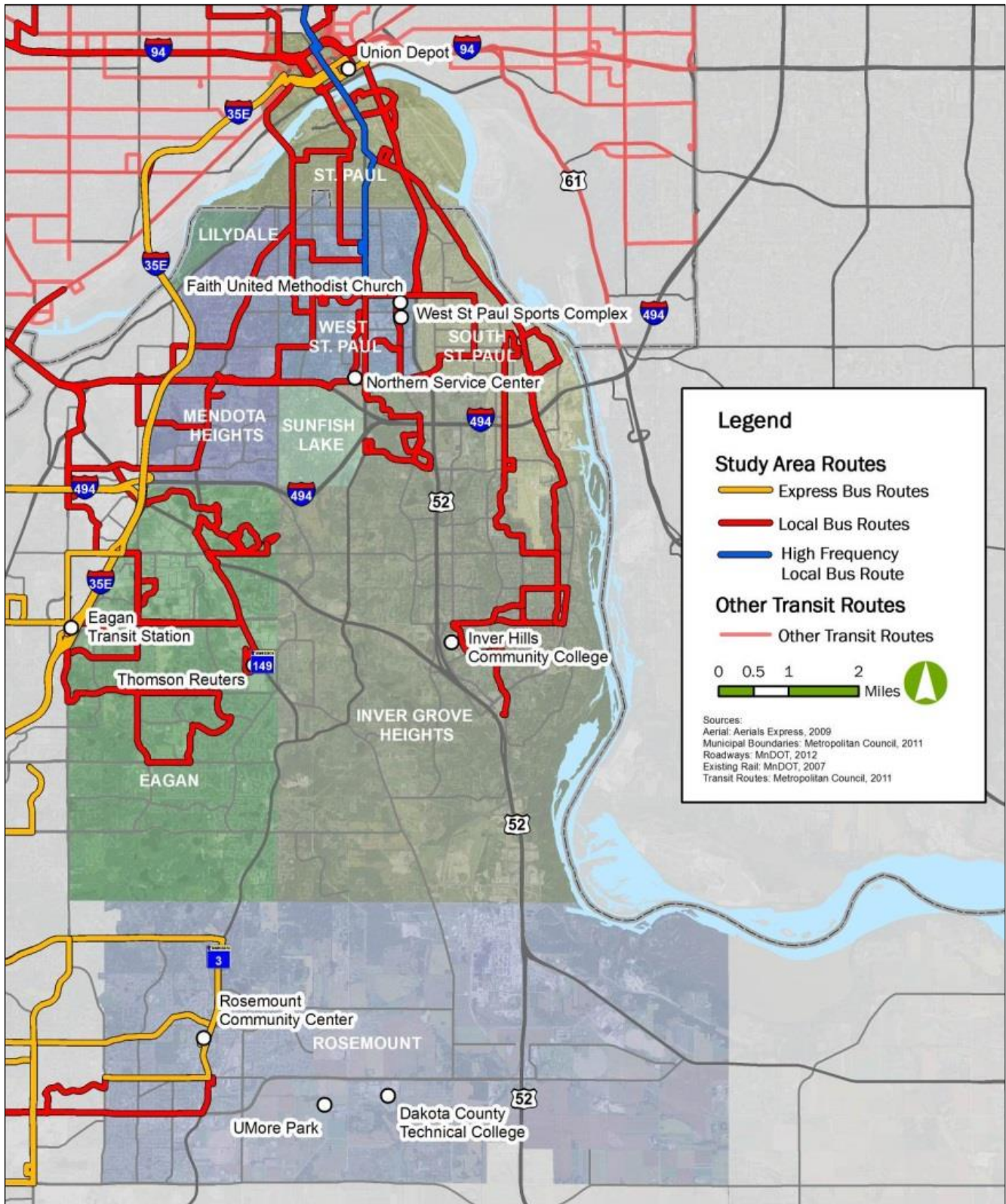


Figure 4 - Existing Transit Service

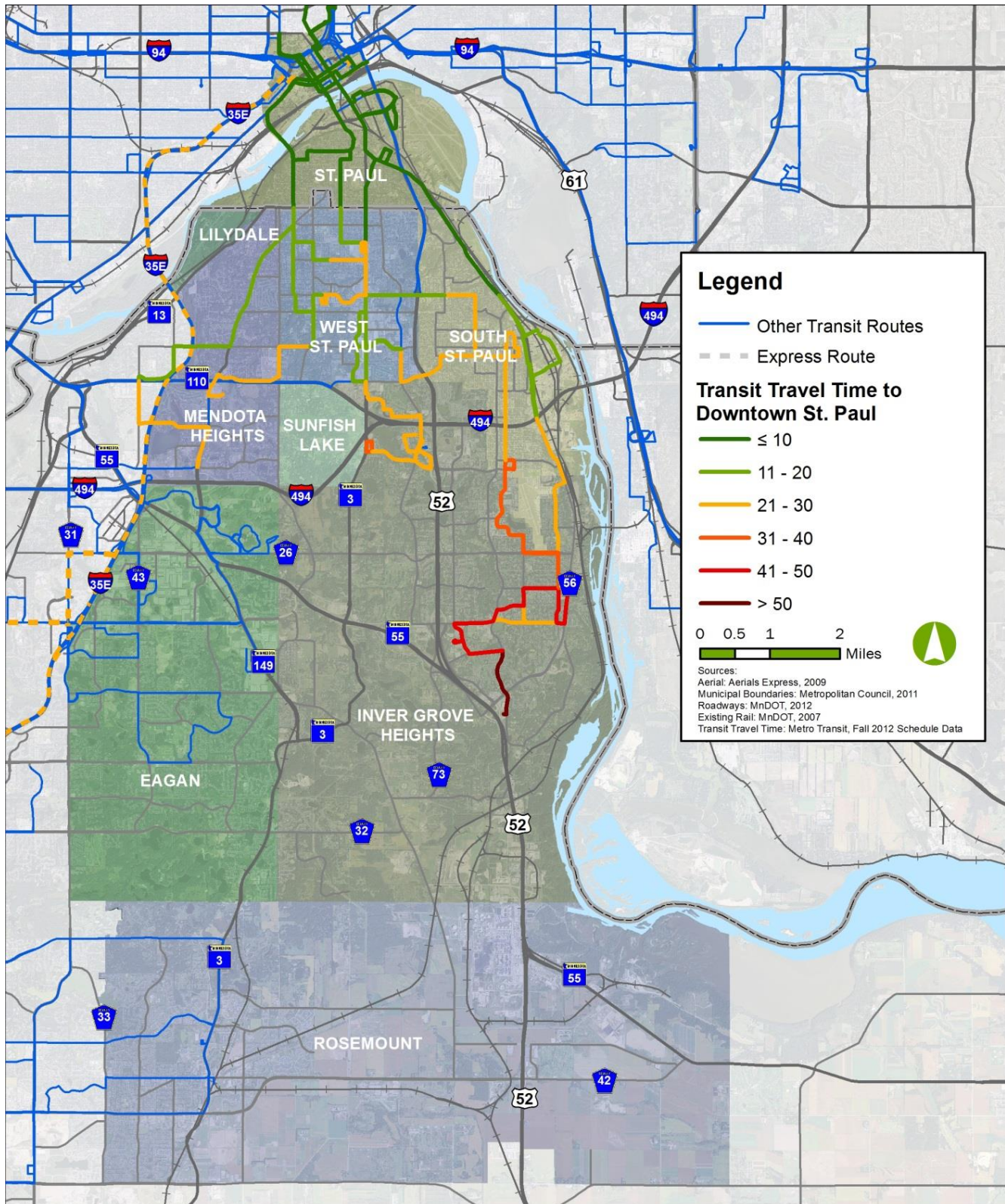


Figure 5 - Transit Travel Time to Downtown St. Paul

3.2.3. People Who Depend on Transit

The Robert Street Transitway study area is home to people who depend on transit to meet their transportation needs, with higher concentrations in specific subareas. Current transit dependence indicators—including number of available vehicles and income levels—suggest that the north and eastern portions of the study area are home to the greatest concentrations of people who depend on transit.

Table 8 shows the number of households in the study area with no vehicles available. While the average percentage of zero vehicle households in the Twin Cities Metropolitan Area is 8 percent (5 percent within the study area), certain communities in the study area—St. Paul, South St. Paul, and West St. Paul—exceed these averages. **Figure 6** shows these concentrations of high transit dependence using a metric of carless adults per acre.

Table 8 - Zero Vehicle Households³

| Area | Total Households | Zero Vehicle Households | Percentage of Zero Vehicle Households |
|--|------------------|-------------------------|---------------------------------------|
| St. Paul* | 110,906 | 17,074 | 15.4% |
| First Ring Suburbs (Lilydale, Mendota Heights, South St. Paul, Sunfish Lake, West St. Paul) | 21,864 | 1,918 | 8.8% |
| Second and Third Ring Suburbs (Eagan, Inver Grove Heights, Rosemount) | 46,205 | 1,754 | 3.8% |
| Study Area Total** | 68,069 | 3,672 | 5.4% |
| Twin Cities Metropolitan Area | 1,113,658 | 89,716 | 8.1% |

* Data is for full city, but area does not fall fully within the study area.

** St. Paul was excluded from this total because only a small portion of the city is within the study area, whereas the other cities listed fall wholly or more than half within the study area.

Level of income can also be an indicator of transit dependence. **Figure 7** shows the distribution of low-income populations within the project area by the percentage of the population living within 150 percent of the poverty threshold. The geographic distribution is consistent with that shown by the other measures, though it shows relatively low-income areas in the eastern portion of the study area (South St. Paul).

³ American Community Survey, 2006-2010; American Community Survey, 2008-2010, where available

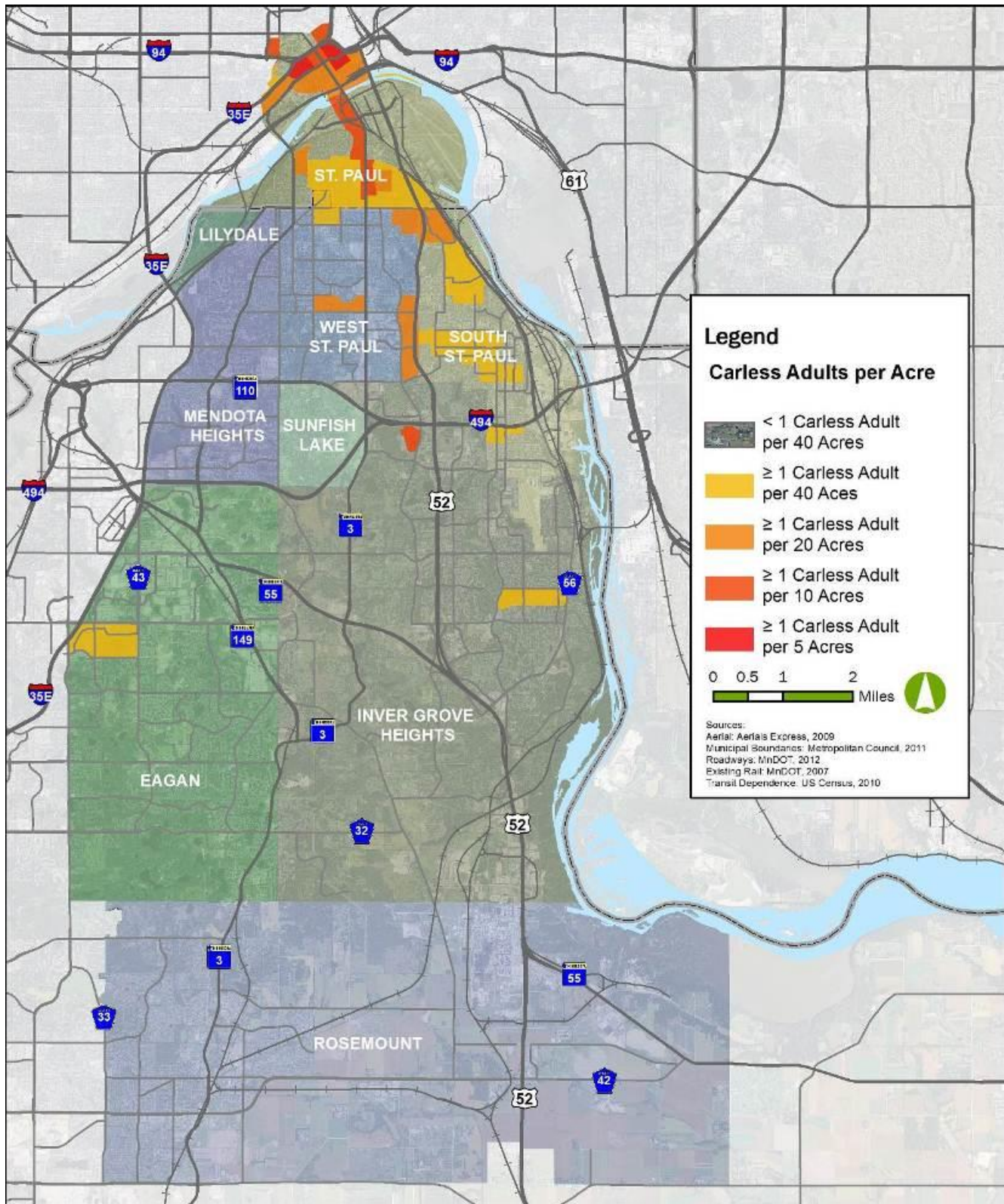


Figure 6 - 2010 Carless Adults per Acre

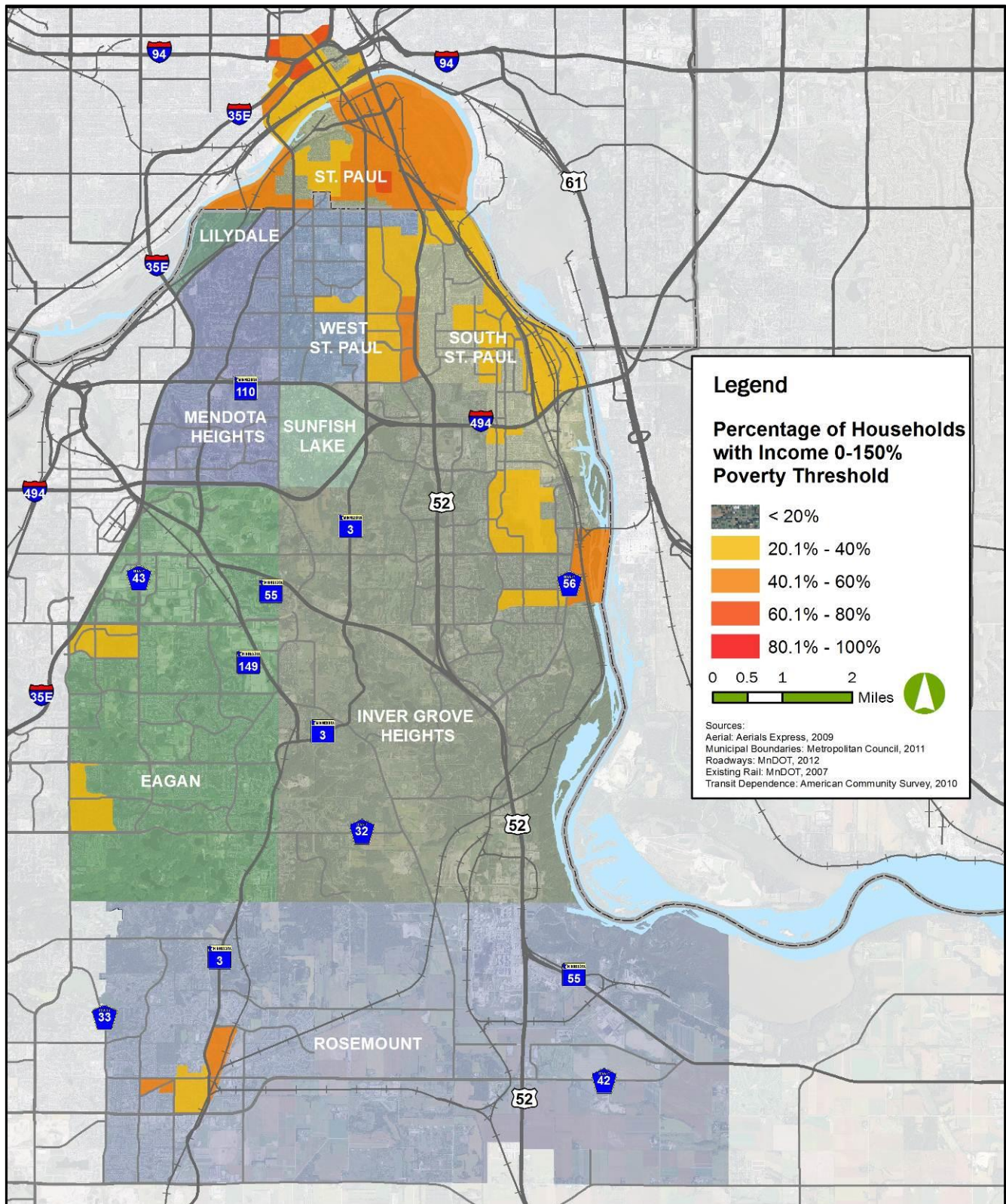


Figure 7 - 2010 Percentage of Households with Income 0 to 150% of the Poverty Threshold

3.2.4. Roadway Congestion and Shift Toward Multimodal Investments

3.2.4.1. Regional Context

Growing local and regional travel demand is expected to result in increased traffic congestion within the Twin Cities region and the Robert Street Transitway study area. Past transportation system management strategies focused on roadway expansion and construction to address this growing demand. However, current policy and funding priorities are moving toward multimodal solutions instead.

The State of Minnesota and the Twin Cities region are shifting away from addressing congestion using highway expansion alone towards a more balanced set of investments. Former MnDOT Commissioner Tom Sorel says the revised approach focuses on “lower cost, high benefit and multimodal solutions,”⁴ and the *Statewide Multimodal Transportation Plan* places unprecedented emphasis on this methodology of building and maintaining the state’s transportation system. The state plan, along with the region’s *2030 Transportation Policy Plan*, both recognize the importance of a balanced approach to meeting travel demand, so both favor projects such as the Robert Street Transitway.

Specifically, the *Statewide Transportation Policy Plan* states that MnDOT and its partners should “Identify global, national, statewide, regional, and local transportation connections essential for Minnesotans’ prosperity and quality of life; maintain and improve these connections by maximizing return-on investment given constrained resources; and consider new connections.” One key strategy of this policy is:

Apply multimodal solutions that ensure a high return on investment, given constrained resources, and that complement the unique social, natural and economic features of

Minnesota: MnDOT will work with the Metropolitan Council to jointly pursue “lower cost, high benefit” projects that support multimodal connectivity.

The objective of optimizing regional mobility through strategies that manage highway traffic congestion is relevant to the Robert Street Transitway project. As shown in **Figure 8**, the Robert Street Transitway study area contains regional roadways and highways that experience congestion today. However, due to continued increases in travel demand coupled with few planned highway capacity improvements, congestion in the study area is expected to increase by 2030. **Figure 9** illustrates segments of regional corridors (principal arterials) and county highways in the study area expected to be congested in 2030, demonstrating a significant increase in roadway congestion compared to current conditions.

As documented in the MnDOT 20-year Highway Investment Plan (2011-2030), there are no planned capacity expansion projects on the state highway system that would address this forecasted congestion in the study area; this is consistent with the *Statewide Multimodal Transportation Policy Plan* strategic and multimodal approach described above. Other than short extensions of CR 32 and CR 28 in Inver Grove Heights, no major improvements to the County Highway system are expected within the study area by 2030.

⁴ MnDOT, “MnDOT releases 20-year Statewide Multimodal Transportation Plan for public review, comment,” MnDOT New Release, June 22, 2012, <<http://www.dot.state.mn.us/newsrels/12/06/22multimodalplan.html>>

The 2030 Transportation Plan indicates a need to study the following intersections in more detail for potential improvements:

- CR 28 & CR 31
- TH 55 & CR 28
- TH 3 & CR 42
- TH 52 & CR 42

However, overall projected congestion within the study area—particularly in the north-south direction on the Principal Arterials—will not significantly change with targeted investments at these congested intersections.

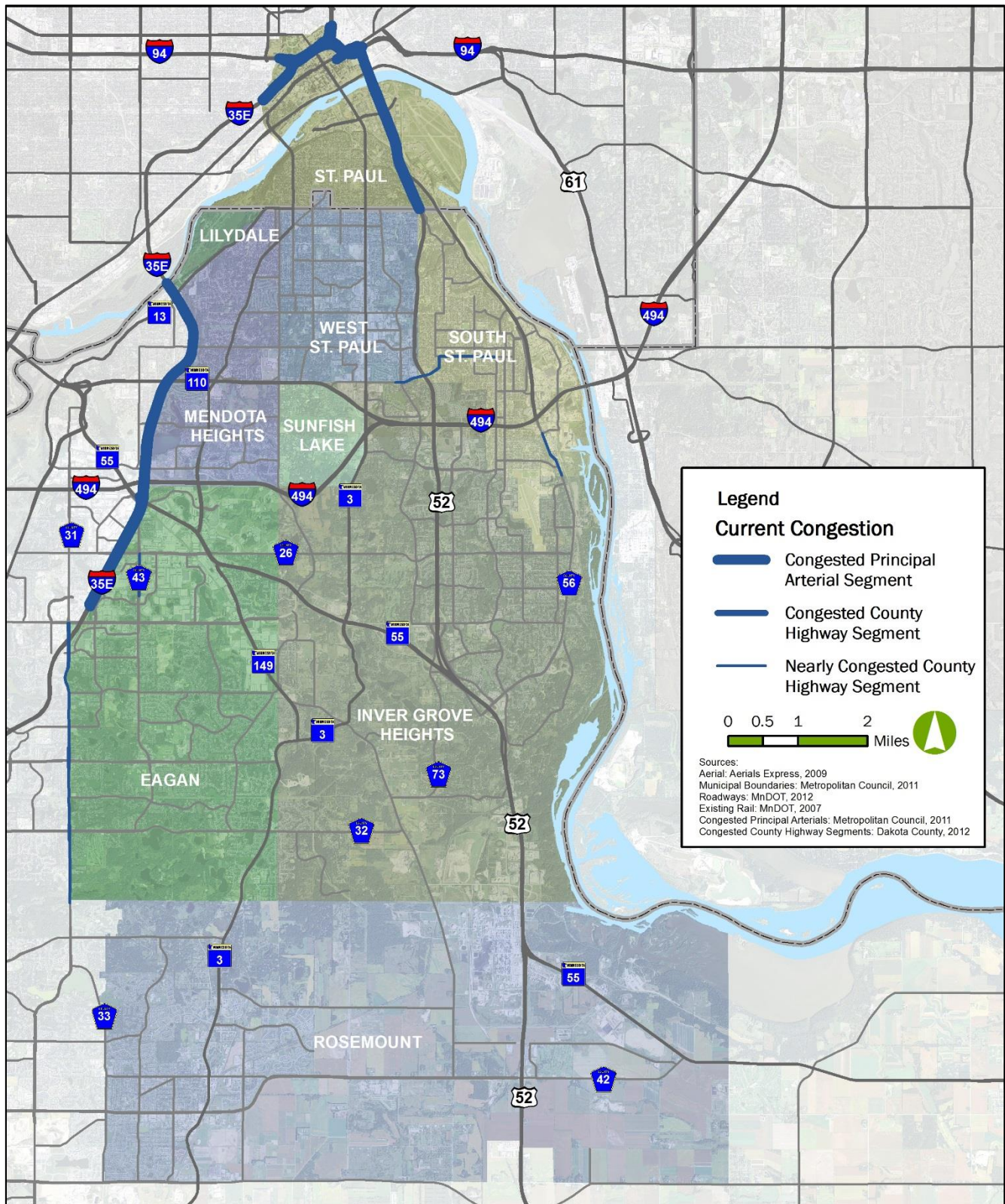


Figure 8 - Existing Congested Principal Arterial and County Highway Segments

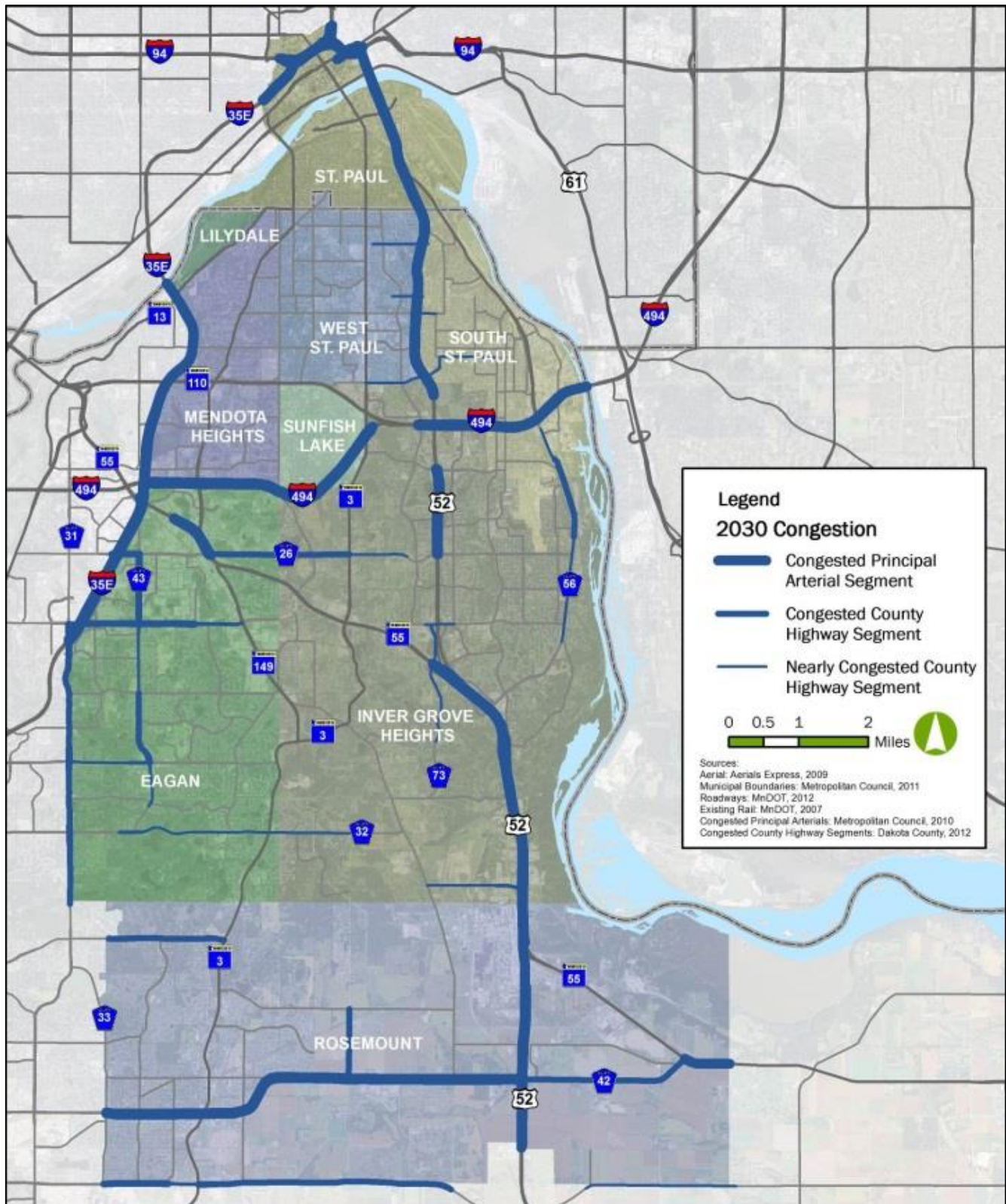


Figure 9 - 2030 Congested Principal Arterial and County Highway Segments

3.2.5. *Regional Objectives for Growth*

The Twin Cities Metropolitan Area is working to ensure the orderly, economical development of its seven-county area. The policies guiding the region's development are articulated in the *2030 Regional Development Framework*, which provides a plan for how the Metropolitan Council and its regional partners can address the challenges of growth and development. Part of the plan includes a framework that supports the goal of seeking to meet the future transportation needs in the Robert Street Transitway study area through transit infrastructure and service. Importantly, the comprehensive plans of each city must be consistent with the policies outlined in the Framework.

The Framework identifies several directions needed to maintain and improve the quality of life the region is known for. Two of these are particularly relevant to transit and transit-oriented development in the region:

- **Focusing attention on the pattern of land uses.** Previously, the regional growth strategy focused on *how much* development occurred in growing communities at the region's developing edge. The 2030 Development Framework pays more attention to *how* development occurs—such as the mix of land uses, the number of housing units per acre, the integration of transit, and the connection of local streets.
- **Recognizing that transportation and land use influence each other.** The 2030 Development Framework emphasizes the need for intensified development in centers with convenient access to transportation corridors and in rural centers along major highways that want to grow. Regional investments are intended to create a transportation system that includes transit solutions that support attractive, walkable neighborhoods with homes, green space, public places, and other amenities.

The Regional Development Framework identifies four policies for guiding growth in the region, each of which is transit-supportive:

- **Accommodate growth in a flexible, connected, and efficient manner.** This policy focuses on clustering housing, business, and retail services in walkable, transit-oriented centers along transportation corridors, noting the many benefits to both individuals and the region resulting from compact development and fewer vehicle miles traveled.
- **Plan and invest in multimodal transportation choices to slow the growth of traffic congestion and serve the region's economic needs.** While multimodal in its intent, this policy includes and requires an emphasis on expanding the regional transit and transitway system.
- **Encourage expanded choices in housing locations and types, and improved access to jobs and opportunities.** In addition to emphasizing the need to provide a wide range of housing choices, this policy also emphasizes the importance of connecting housing and jobs through a multimodal transportation system that includes auto, transit, biking, and walking.
- **Conserve, protect, and enhance the region's vital natural resources.** This policy identifies the many benefits to natural resources from reduced reliance on the automobile including improved air and water quality and less depletion of limited aggregate resources typically used for road construction and maintenance.

4. Project Goals and Objectives

The project goals and objectives were developed to address the underlying needs for the Robert Street Transitway project, and were used as a means to guide the evaluation of alternatives developed during the AA study process. To ensure effective evaluation, order was established through the assignment of primary and secondary goals. Primary goals directly resolve the transportation problem within the study area, whereas secondary goals are not directly tied to the transportation problem. By resolving the transportation problem, secondary goals may be achieved as complementary benefits.

Table 9 outlines the primary and secondary project goals. Each goal was clarified with a list of objectives and a set of evaluation measures to be used to determine whether the goal was being met.

Table 9 - Goals, Objectives, and Evaluation Measures

| Goal | | Objectives | Evaluation Measures |
|---------------|---|--|---|
| PRIMARY GOALS | Improve mobility and accessibility | <ul style="list-style-type: none"> Maximize total transit riders Maximize transit access to housing, employment, schools, community services, and activity centers Maximize transportation system linkages and access to multimodal transportation opportunities Improve east-west connections Maximize service to people who depend on transit Expand reverse commute and off-peak transit service options. | <ul style="list-style-type: none"> Total riders Population, employment, and activity centers within ½ mile of stations Intersection density, accessibility, and bicycle & pedestrian facilities within ½ mile of stations Number of connections created Daily transit riders from zero-car households Reverse commute trips and off-peak period trips |
| | Enhance the effectiveness of transit service within the corridor | <ul style="list-style-type: none"> Maximize new transit riders Maximize transit operating efficiency (passengers per hour of revenue service) Maximize traveler time savings Maximize access to park-and-ride facilities | <ul style="list-style-type: none"> New transit riders Passengers per hour of revenue service Daily user benefit hours Park-and-ride capacity and availability |
| | Provide cost effective and financially feasible transit solutions | <ul style="list-style-type: none"> Seek competitive project capital and operating costs Maximize competitiveness for potential funding sources | <ul style="list-style-type: none"> Capital costs and operating costs Revenues and cost per new rider |

| Goal | | Objectives | Evaluation Measures |
|-----------------|--|---|--|
| SECONDARY GOALS | Support and enhance existing communities and planned development | <ul style="list-style-type: none"> • Maximize consistency with local and regional land use plans • Maximize proximity to planned development and redevelopment • Encourage transit-oriented development (TOD) in areas identified for future development or redevelopment | <ul style="list-style-type: none"> • Comprehensive plan assessment • Undeveloped sites within ½ mile of stations and TIF acreage within ½ mile of stations • Planned mixed use or high-density development within ½ mile of stations and Walk Score • Advanced economic development analysis |
| | Support healthy communities and sound environmental practices | <ul style="list-style-type: none"> • Minimize need for new right-of-way • Minimize short- and long-term impacts to property and property access • Minimize area traffic impacts • Minimize adverse impacts on community resources (parks, schools, facilities) • Minimize disproportionately high and adverse impacts on minority and/or low-income communities • Minimize adverse impacts on water resources (wetlands, lakes, floodplains) • Maximize benefits due to decreased vehicle travel | <ul style="list-style-type: none"> • Acres of proposed right-of-way acquisition • Property access and parking losses • High-level traffic impact analysis • Historical resources impacts and noise, & vibration impacts • High-level environmental justice scan • Wetland impacts • Reduction in vehicle miles traveled (VMT) |

5. AA Universe of Alternatives

The first step of alternatives development in the AA process generally involves the identification of the universe of transit options, which could be used in the study area considering every possible transit technology and the massive array of alignment options. However, because the DCRRA had already completed the Robert Street Corridor Transit Feasibility Study in 2008—the purpose of which was to develop a long-term transit vision for the corridor, provide information on transit investment and land use decisions, and make short-term transit investment recommendations—the project team elected to use the nine (9) route recommendations from that study as the initial base of alternatives to be considered by the AA. These nine corridors for potential transit projects included: Robert Street, TH 52/Lafayette, I-35E/Riverview, Smith/TH 149, Concord/TH 52, TH 55, I-494, UP Railroad West, and UP Railroad East. The project team then brought these candidate corridors to a Technical Advisory Committee (TAC) which ultimately narrowed the list to four (4) corridors for further analysis: Robert St, Lafayette/TH 52, TH 55, and UP Railroad West. Within these four corridors, seven alternative alignments were identified for further study.

However, to ensure thoroughness, this AA Study also re-considered the candidate corridors eliminated during the 2008 Feasibility Study. In August of 2012, the Robert Street AA project team held a three-hour Steering Committee workshop to engage committee members on, amongst other things, the identification of potential transitway corridors and alignments within the study area. Attendees worked in small groups with large maps of the study area that showed roadways as well as the seven recommended alignments and candidate corridors resulting from the 2008 Feasibility Study. Significant discussion resulted in the identification of the following additional alignments as candidates for study:

- Argenta Trail
- Oakdale Avenue/Babcock Trail
- Upper 55th Street East/Cahill Avenue
- Blaine Avenue
- 110th Street West/Akron Avenue

These five alignments were then added to seven already on the maps examined at the meeting, and all twelve were presented to the general public for comment. Following two public meetings, which sought feedback on the universe of alternatives to ultimately be screened, only one (1) additional alignment was identified for consideration: County Road 71 in Rosemount and Inver Grove Heights. Together, this collection of alignments became the starting point for examination amongst the universe of alternatives.

5.1. Alternatives Considered

The thirteen final alignments identified through the 2008 Feasibility Study, Steering Committee workshop, and public open houses represented only the first step in the narrowing of the universe of alternatives. To further refine the options being considered, the identified corridors were first separated into thirty-three (33) logical segments for comparison purposes. These segments are listed in **Table 10** and are shown on **Figure 10**.

Table 10 - Segments Identified for Screening

| Segment | North/West Terminus | South/East Terminus |
|--|---------------------------------|------------------------------|
| Robert Street | Downtown St. Paul (Union Depot) | Mendota Road |
| TH 52 (North) | Downtown St. Paul (Union Depot) | Southview Boulevard |
| TH 52 (Middle) | Southview Boulevard | Concord Avenue |
| TH 52 (South) | Concord Avenue | CR 42 |
| Concord Avenue (North) | Downtown St. Paul (Union Depot) | I-494 |
| Concord Boulevard (South) | I-494 | TH 52 |
| UP Railroad East (North) | Downtown St. Paul (Union Depot) | I-494 |
| UP Railroad East (Middle) | I-494 | 55 |
| UP Railroad East (South) | TH 55 | CR 42 |
| UP Railroad West (North) | Downtown St. Paul (Union Depot) | TH 110 |
| UP Railroad West (Middle) | TH 110 | TH 3 (Robert Trail) |
| UP Railroad West (South) | TH 3 (Robert Trail) | CR 42 |
| Shepard Road – I-35E (North) | Downtown St. Paul (Union Depot) | TH 110 |
| Shepard Road – I-35E (South) | TH 110 | TH 3 (Robert Trail) |
| Smith Avenue – TH 149 (North) | Downtown St. Paul (Union Depot) | TH 110 |
| Smith Avenue – TH 149 (South) | TH 110 | TH 3 (Robert Trail) |
| Oakdale Avenue | Annapolis Street | Mendota Road |
| Babcock Trail | Mendota Road | 80 th Street East |
| TH 110 – Mendota Road – Southview Boulevard | I-35E | Mississippi River |
| TH 55 | I-35E | TH 3 |
| Blaine Avenue | Southview Boulevard | 80 th Street East |
| I-494 Segment | TH 3 | Argenta Trail |
| TH 3 (North) | TH 110 | TH 55 |
| Upper 55th Street East – Cahill Avenue | TH 3 | Concord Avenue |
| Argenta Trail | I-494 | TH 149 |
| New Right of Way | I-494 | TH 149 |
| CR 28 – TH 55 – 80 th Street East | Pilot Knob Road | Concord Avenue |
| Robert Trail | TH 55 | TH 149 |
| CR 71 | Robert Trail | CR 42 |
| TH 3 (South) | TH 149 | CR 42 |
| 110th Street West – Akron Avenue | TH 3 | CR 42 |
| CR 42 | CR 33 | TH 55 |
| TH 110 Segment | TH 3 | TH 52 |

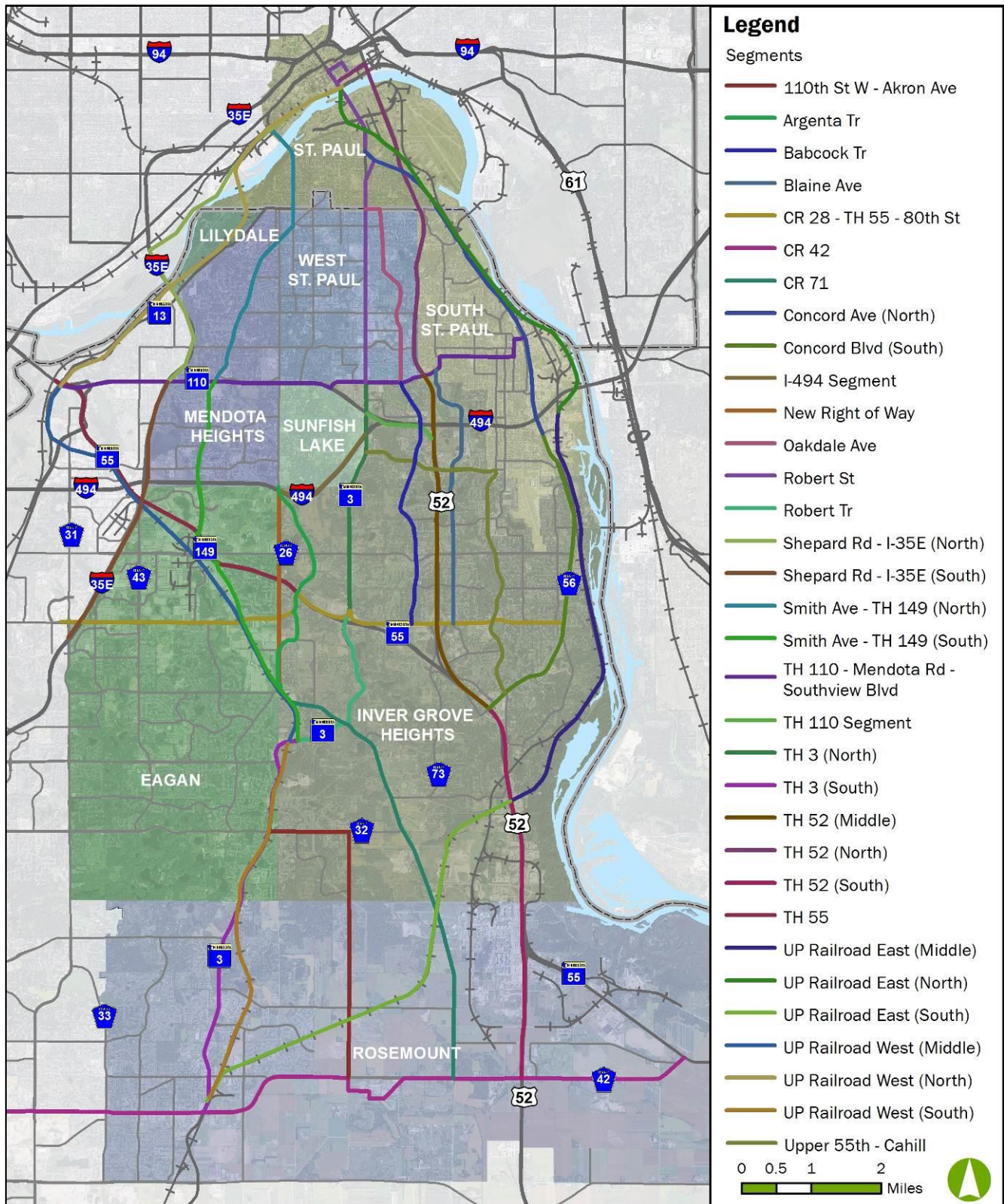


Figure 10 - Segments Identified for Screening

In addition to identifying all corridors for possible study, the universe of transit modes also had to be examined. As was done with the universe of possible corridors & alignments, the project team elected to use the findings of the 2008 Feasibility Study as a baseline of modes to study; and then allowed the Regional Transitway Guidelines, the Transportation Policy Plan, and input from the project team and committees to narrow the available options. The following modes were the ones considered in detail during the screening process:

- Express Bus
- Highway Bus Rapid Transit (BRT)
- Arterial BRT
- Light Rail Transit (LRT)
- Dedicated Busway
- Modern Streetcar
- Commuter Rail

Prior to screening, several modes were eliminated primarily due to a lack of regional precedence, an inappropriate match to the project corridor, and/or the anticipated cost barriers relative to reasonable expectations for ridership. Such eliminated modes included:

- Heavy Rail Transit: Offers high speeds in urban environments with very high capacities. However, it is among the most expensive forms of public transit due to the requirement for full grade separation, and would therefore require ridership projections only attainable in very dense urban areas.
- Monorail/Automated Guideway Transit (AGT): Like heavy rail transit, requires complete grade separation and thus demands very high ridership potential to justify the costs.
- Personal Rapid Transit (PRT): Has only been implemented under special circumstances and is typically designed to serve small communities with a non-linear, flexible transit system. The required number of stations and total amount of infrastructure makes PRT cost-prohibitive for a standard linear transitway corridor.

Managed lanes—which can be considered both modes and facilities—were also not considered within the Robert Street AA. In the Twin Cities Metropolitan Region, managed lanes are most-widely recognized as those within the MnPASS system of price-dynamic, high-occupancy tolling (HOT) lanes. This transportation management solution provides a transit advantage for buses operating within the managed lane, while also serving high occupancy vehicles and personal automobiles that pay for use. As a shared facility, the managed lane is not dedicated for transitway purposes. Under the 2012 Federal Surface Transportation Act: Moving Ahead for Progress in the 21st Century (MAP-21), the FTA transitway funding criteria for the New Starts capital improvements program requires that more than half of a transitway be dedicated in order to receive funding. As a result, managed lanes are not eligible for FTA New Starts Funding and therefore are not being considered in the initial universe of alternatives. However, due to the aforementioned transitway benefits of managed lanes, there is a potential that a managed lane may be considered in subsequent analysis of advanced highway BRT alternatives.

5.2. Preliminary Screening Criteria

A preliminary screening process was designed to objectively identify the most competitive transit alternatives for detailed analysis. Specific criteria were devised that not only keyed in on the mode and alignment combinations which satisfied the project's Purpose and Need, but also identified those which showed the best potential to satisfy the project goals and objectives. By eliminating segments and modes that either did not

satisfy the Purpose and Need or were shown to have limited ridership potential based on a high-level analysis of future population and employment densities, subsequent stages of the analysis could then focus on the most-promising transitway alternatives.

Accomplishing this task required the use of three screening reviews. The first screen examined a segment's ability to achieve the goals exemplified within the adopted project purpose statement:

"The purpose of the Robert Street Transitway is to provide the necessary transit infrastructure and service to meet the long-term regional mobility and local accessibility needs between downtown St. Paul and north central Dakota County."

To ensure that alternatives satisfactorily met this purpose, three criteria were developed to screen segments. In order to advance, a segment had to satisfy all three purpose criteria.

- (1) **Feature a north-south alignment that serves the study area:** In order to connect downtown St. Paul and areas within Dakota County, a north-south alignment is needed to serve as the transit backbone within the study area. Segments that feature a north-south alignment within the study area are consistent with the need for a north-south transitway.
- (2) **Have a north end that serves downtown St. Paul or connects to segment(s) that serve downtown St. Paul:** As articulated in the project purpose, the transitway is intended to serve downtown St. Paul and areas within Dakota County. Segments that neither terminate in downtown St. Paul nor connect to another segment that terminates in downtown St. Paul are not consistent with the project purpose on this basis.
- (3) **Preference for arterial functional classification:** A transitway by definition is intended to maintain access to a range of destinations, provide connections to regional destinations, and support transit-oriented development. The design and context of streets designated as arterials typically emphasize mobility over land access, whereas the design and context of collector and local streets typically emphasize land access over mobility. Arterials also better facilitate the integration of travel demand and transit-oriented development and the connection of local and regional destinations. A transitway, therefore, is typically better suited to arterial streets and less well suited to collector or local streets.

The first screen was fairly straightforward as it simply examined a segment's ability to serve the desired north-south alignment. As shown in **Table 11**, which provides the pass/fail grades for each segment that was studied, approximately two-thirds of the segments were advanced to the second screen. **Figure 11** provides an illustration of the advancing segments.

Table 11 - Screen #1: Meets Project Purpose

| Segment | Criterion 1. Segment features a north-south alignment that serves the study area. | Criterion 2. Segment has a north end that serves downtown St. Paul or connects to segment(s) that serve(s) downtown St. Paul. | Criterion 3. Segment preferred to be an arterial, consistent with transitway intent. | Result |
|-------------------------------|--|--|---|--------|
| Robert Street | + | + | + | + |
| TH 52 (North) | + | + | + | + |
| TH 52 (Middle) | + | + | + | + |
| TH 52 (South) | + | + | + | + |
| Concord Avenue (North) | + | + | + | + |
| Concord Boulevard (South) | + | + | + | + |
| UP Railroad East (North) | + | + | + | + |
| UP Railroad East (Middle) | + | + | + | + |
| UP Railroad East (South) | + | + | + | + |
| UP Railroad West (North) | X | + | + | X |
| UP Railroad West (Middle) | X | + | + | X |
| UP Railroad West (South) | + | + | + | + |
| Shepard Road – I-35E (North) | X | + | + | X |
| Shepard Road – I-35E (South) | + | + | + | + |
| Smith Avenue – TH 149 (North) | + | + | + | + |
| Smith Avenue – TH 149 (South) | + | + | + | + |
| Oakdale Ave | + | + | X | X |
| Babcock Tr. | + | + | X | X |
| TH 110 - Mendota to Southview | X | X | + | X |
| TH 55 | X | X | + | X |
| Blaine | + | + | X | X |
| I-494 Segment | X | + | + | X |
| TH 3 (North) | + | + | + | + |
| Upper 55th - Cahill Ave | + | + | + | + |
| Argenta Tr. | + | + | X | X |
| Delaware Ave Ext. (New ROW) | + | + | X | X |
| CR 28 - TH 55 - 80th St | X | X | + | X |
| Robert Tr. | + | + | + | + |
| CR 71 | + | + | + | + |
| TH 3 (South) | + | + | + | + |
| 110th St - Akron Ave | + | + | + | + |
| CR 42 | X | X | + | X |
| TH 110 Segment | X | + | + | X |

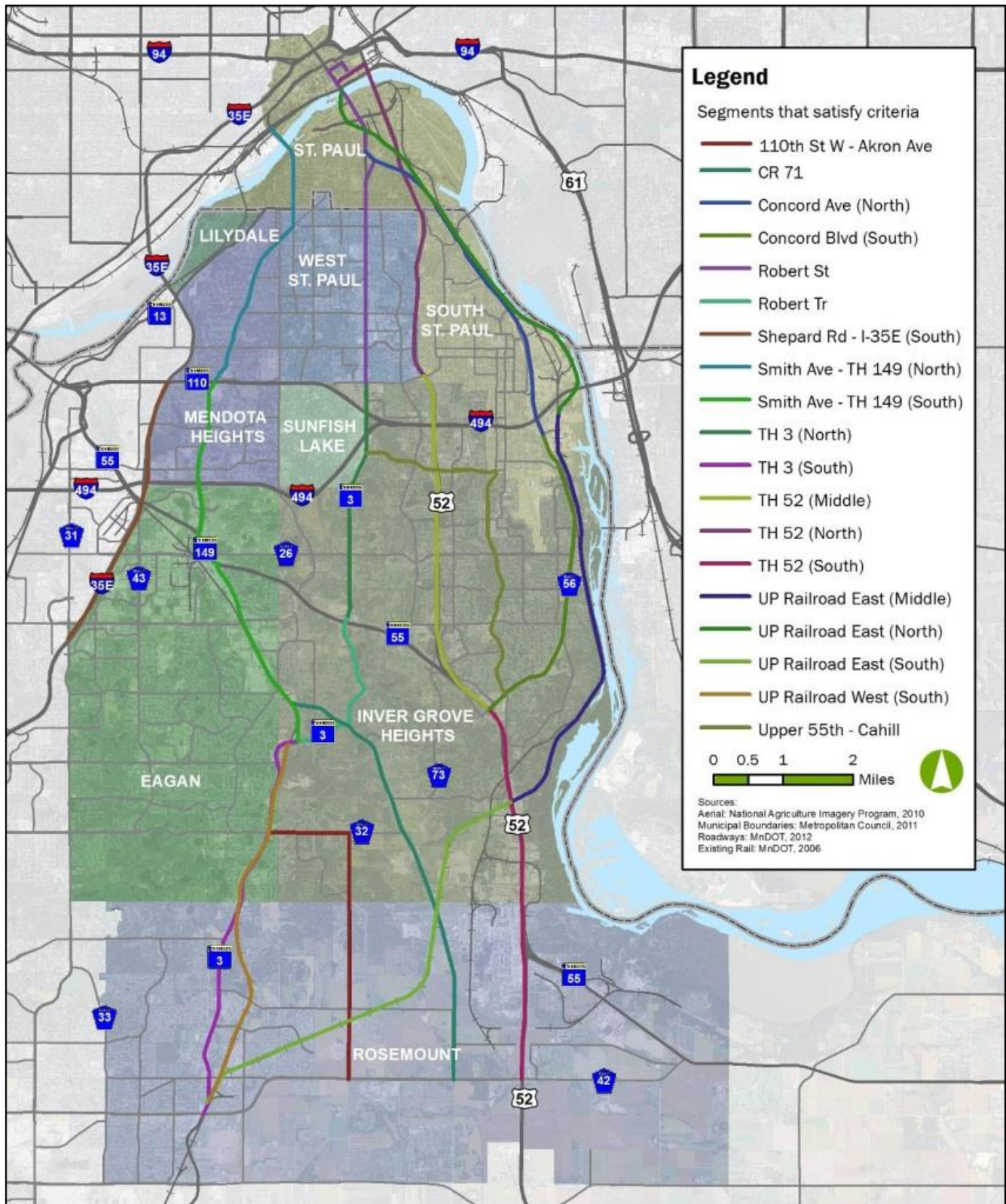


Figure 11 - Segments Advanced Following Screen #1

The second screen examined a segment's ridership potential. To conduct this assessment, ridership potential indicators were developed with the understanding that ridership is essential to meeting the project's needs, goals, and objectives; and is a primary factor in determining the competitiveness of a transitway project for a limited pool of federal transit funds. In other words, a potential transitway alignment with poor ridership—despite other reasons why it might be desirable—has little chance of being constructed.

Four (4) indicators of ridership were analyzed for each segment to identify ridership potential.

- The first indicator examined the future *population* density within ½ mile of a segment to determine if it was at least minimally transit supportive (defined as being ≥ 4 units/acre⁵).
- The second indicator examined the future *employment* density within ½ mile of a segment to determine if it was at least minimally transit supportive (defined as being ≥ 4 jobs/acre).
- The third indicator examined whether a segment was within ½ mile of areas with *transit dependence* (defined as an area with ≥ 1 carless adult per 40 acres⁶).
- The fourth and final indicator examined whether a segment was within ½ mile of at least one *key activity center*.⁷

Figure 12 illustrates findings on population and employment densities along with activity centers within the study area, and **Figure 13** identifies areas of transit dependence, which factored into the ridership potential analysis.

In order to advance to the third screen, a segment had to meet all four of the ridership indicator criteria; however, given the approximate nature of these measures, the threshold for each was set relatively low so as not to prematurely eliminate segments. The analysis was completed with the understanding that a more precise understanding of ridership would be subsequently developed for those alternatives that advanced for detailed analysis. A sensitivity analysis was performed at a lower threshold in all cases to validate the thresholds for advancement. The analysis confirmed that slight changes to the thresholds did not significantly change the results, indicating that the procedure was sufficient to identify the areas with generally higher density and greater transit dependence within the study area.

⁵ A Toolbox for Alleviating Traffic Congestion, ITE, 1989

⁶ Based on Metropolitan Council's preferred transit dependence measure

⁷ Key activity centers identified by project team

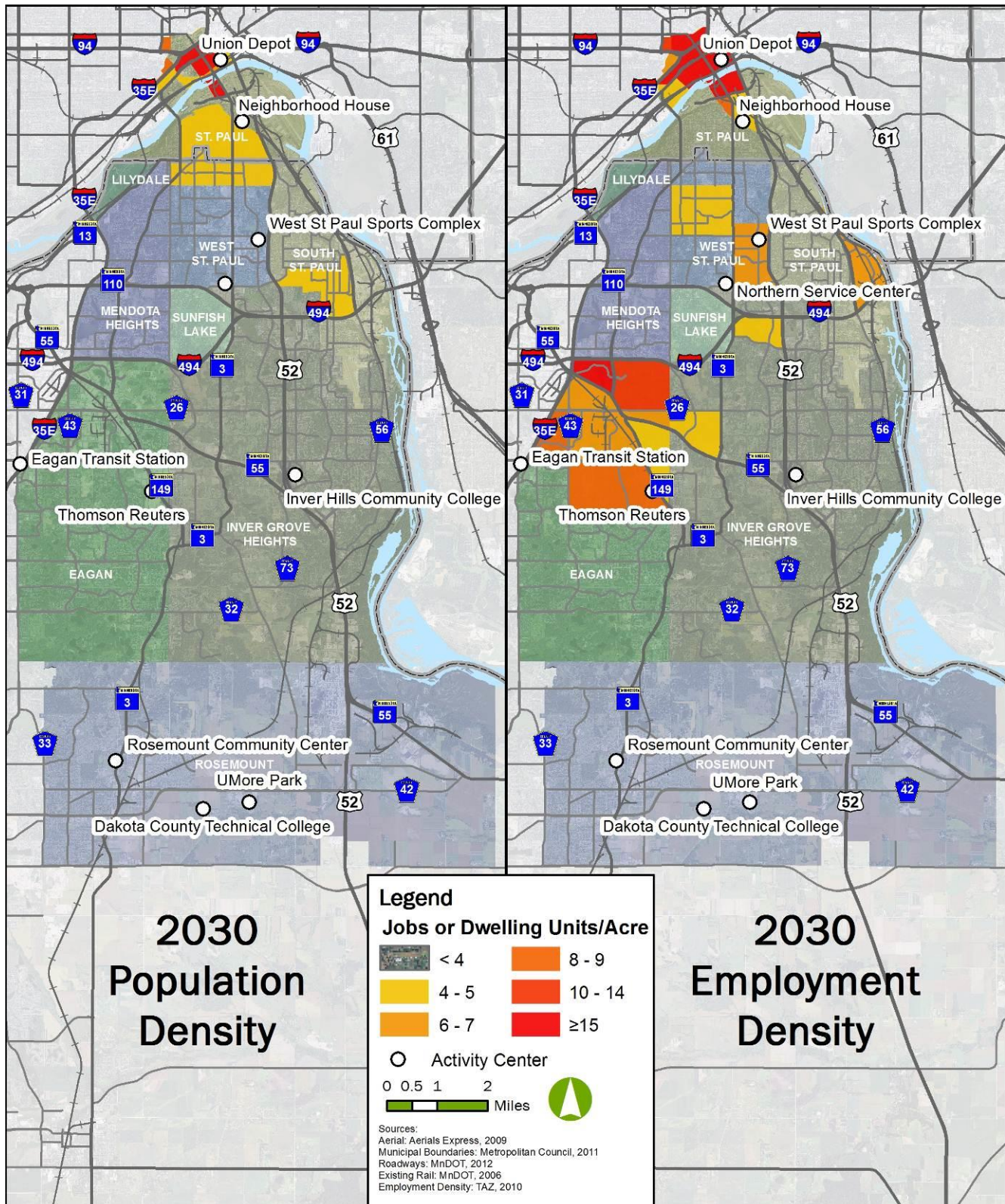


Figure 12 - Future Population and Employment Density with Activity Centers

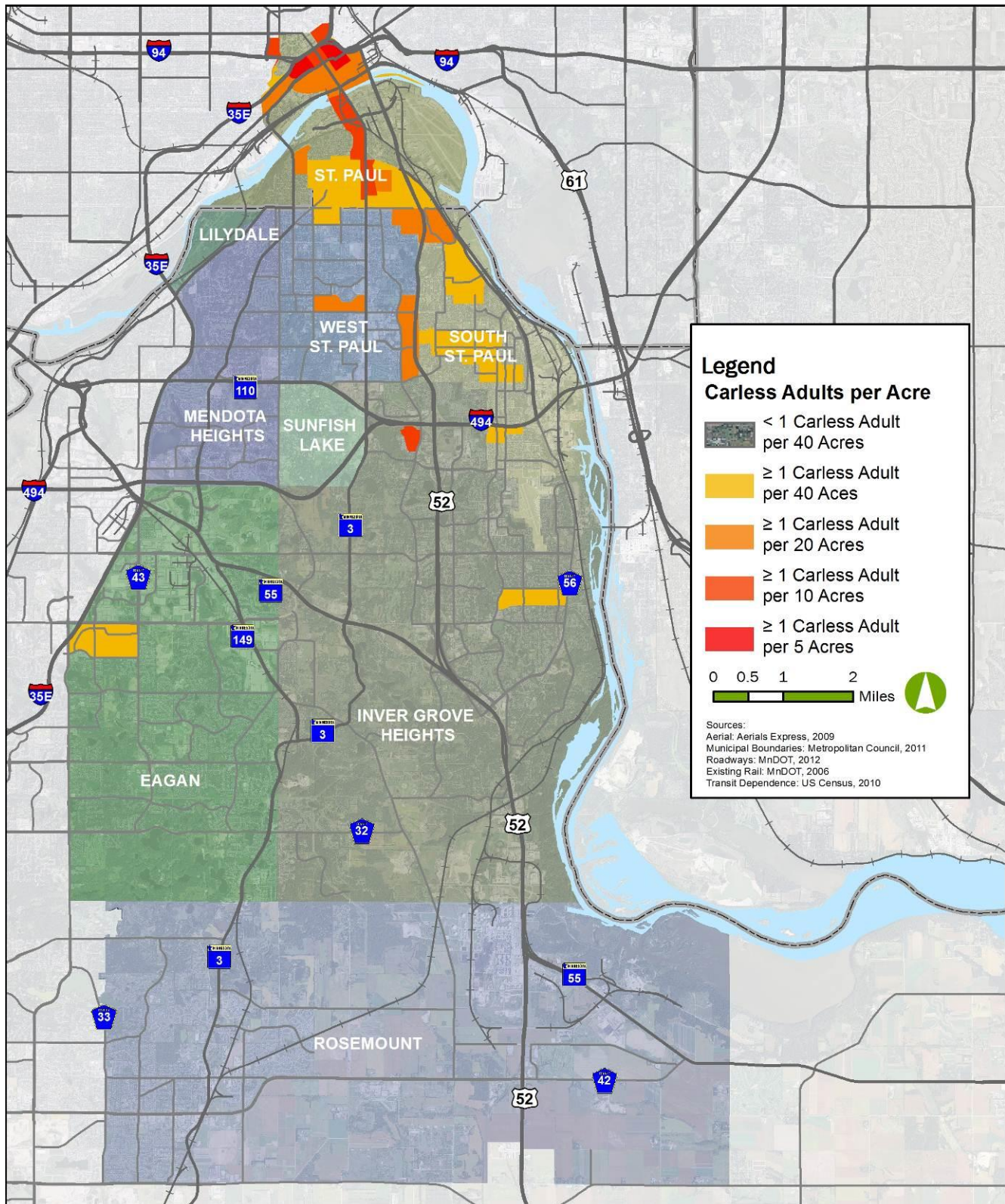


Figure 13 - Transit Dependence

Five segments passed the second screen for ridership potential. **Table 12** shows the pass/fail grades for each segment, and **Figure 14** shows the segments that advanced to the third and final screen.

Table 12 - Screen #2: Indicators of Ridership Potential

| Segment | Criterion 1. Future population density within 1/2 mile of segment is at least minimally transit supportive | Criterion 2. Future employment density within 1/2 mile of segment is at least minimally transit supportive | Criterion 3. Segment is within 1/2 mile of areas with transit dependence | Criterion 4. Segment is within 1/2 mile of at least one key activity center | Result |
|----------------------------------|---|---|--|--|--------|
| Robert Street | + | + | + | + | + |
| TH 52 (North) | + | + | + | + | + |
| TH 52 (Middle) | + | + | + | + | + |
| TH 52 (South) | X | X | X | X | X |
| Concord Avenue (North) | + | + | + | + | + |
| Concord Boulevard (South) | X | X | + | + | X |
| UP Railroad East (North) | + | + | + | + | + |
| UP Railroad East (Middle) | X | X | X | X | X |
| UP Railroad East (South) | X | X | X | + | X |
| UP Railroad West (South) | X | X | X | + | X |
| Shepard Rd – I-35E (South) | X | + | + | + | X |
| Smith Avenue – TH 149 (North) | + | X | + | + | X |
| Smith Avenue – TH 149 (South) | X | + | X | + | X |
| TH 3 (North) | X | X | X | + | X |
| Upper 55th - Cahill Ave | X | + | + | + | X |
| Robert Tr. | X | X | X | X | X |
| CR 71 | X | X | X | + | X |
| TH 3 (South) | X | X | X | + | X |

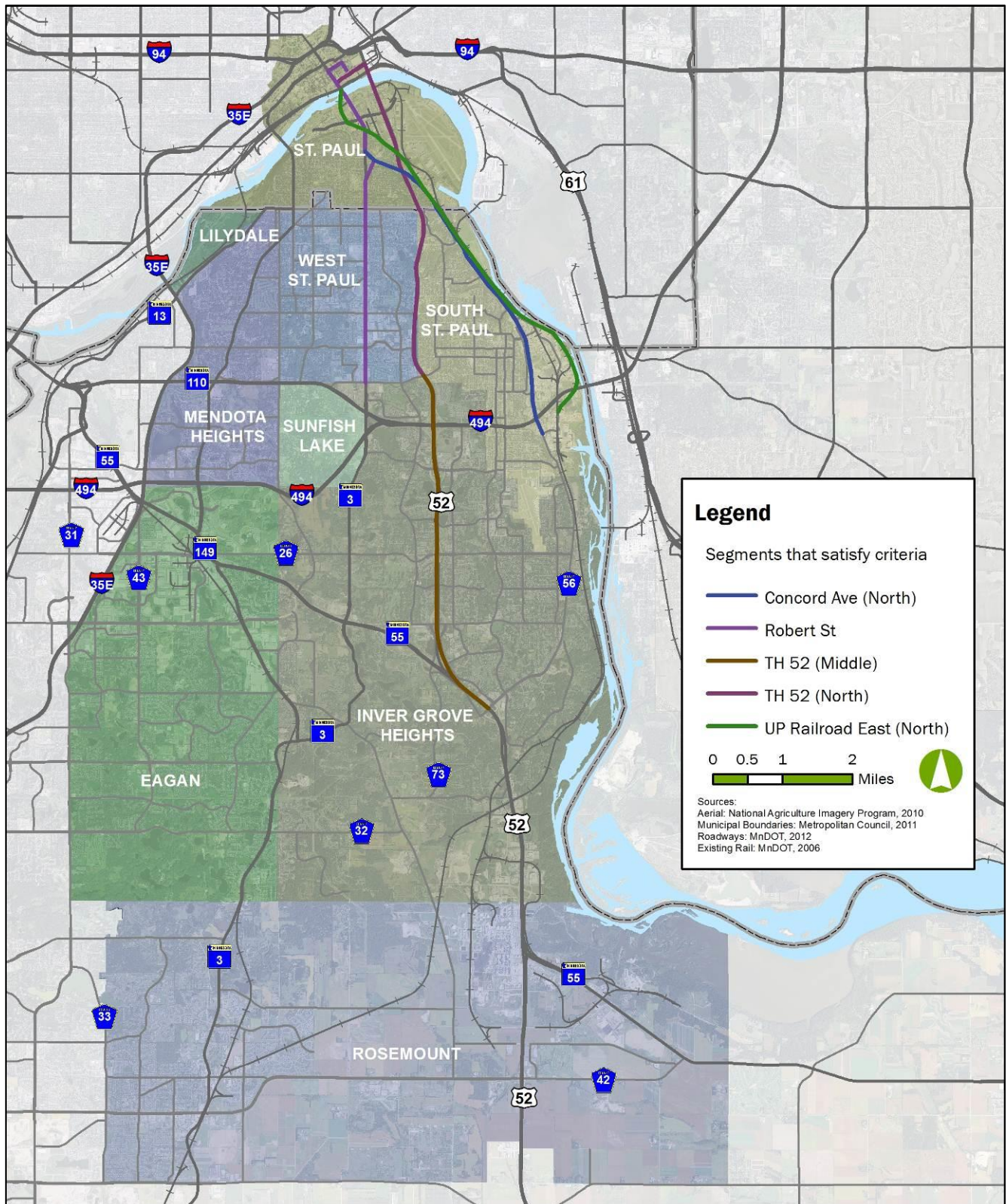


Figure 14 - Segments Advanced Following Screen #2

The third and final screen examined the remaining segments against potential transitway modes. To do so, the remaining segments were first grouped into alignments based on logical routes for a transitway. Those alignments are shown in **Table 13**.

Table 13 - Alignments Advanced to Screen #3

| Alignment | North Terminus | South Terminus |
|------------------|-------------------|--|
| Robert Street | Downtown St. Paul | Mendota Rd. (Northern Service Center) |
| TH 52 | Downtown St. Paul | Concord Avenue (Inver Hills Community College) |
| UP Railroad East | Downtown St. Paul | I-494 (South St. Paul) |
| Concord Avenue | Downtown St. Paul | I-494 (South St. Paul) |

The remaining alignments had to meet three fundamental characteristics of a mode to advance beyond screen three; each characteristic was identified as a key indicator of potential transitway success. Thresholds for the first two criteria were set based on regional guidance (Metro Transit’s Transitway Guidelines) and professional judgment.

- (1) **Recommended facility type:** a proxy for cost competitiveness, which is essential for obtaining federal funding. This criterion was intended to match appropriate transit mode(s) to the function, typical dimensions, and adjacent land uses of the alignment in question. Existing facilities incompatible with a proposed mode would require substantial capital investments which would be cost-prohibitive to project completion.
- (2) **Typical system length:** a surrogate of travel time competitiveness and cost-effectiveness. Facilities too short for a medium to long distance transit mode (LRT, Highway BRT, commuter rail) would have few stations with limited overall ridership potential, and would not provide a long enough distance for the mode (travel time savings) to compete with the personal automobile. Facilities too long for a short to medium distance transit mode (modern streetcar, arterial BRT) would suffer from long travel times due to frequent stops and would not be able to compete for mode share among medium to long distance commuters.
- (3) **Site-specific physical constraints:** provided for the review of a generic mode and alignment combination (e.g., LRT on an arterial facility) against the physical context (available right-of-way, etc.) of the specific facilities under consideration. The intent was to identify any cases where the physical conditions suggest a “fatal flaw” in the reasonable ability to construct or operate a given mode on a given alignment.

Following this third and final screening, the results of which are shown in **Table 14**, seven mode / alignment alternatives were identified to move on to the conceptual definition of alternatives phase (see **Table 15**). In response to interest expressed by the project team in exploring ridership potential to activity centers within the southern sector of the study area, an eighth alternative—identified as a potential express bus/highway BRT service extension—was also selected for further study. All eight alternatives moved on for further consideration are illustrated in **Figure 15**.

Table 14 - Screen #3: Mode

| Mode Alternatives | | | | | | | | | | | | | | | |
|-------------------------|---------------------------|-----------------------|----------------------|---------------------------|-----------------------|----------------------|---------------------------------------|-----------------------|----------------------|------------------------------|-----------------------|----------------------|---------------------------|-----------------------|----------------------|
| Alignment Alternatives | Arterial BRT | | | Modern Streetcar | | | Light Rail Transit & Dedicated Busway | | | Highway BRT | | | Commuter Rail | | |
| Facility | Recommended Facility Type | Typical System Length | Physical Constraints | Recommended Facility Type | Typical System Length | Physical Constraints | Recommended Facility Type | Typical System Length | Physical Constraints | Recommended Facility Type | Typical System Length | Physical Constraints | Recommended Facility Type | Typical System Length | Physical Constraints |
| | Minor Arterial | 5 to 15 miles | | Minor Arterial | 1-5 miles | | Principal/ Minor Arterial, Railroad | 5-20 miles | | Principal Arterial (Highway) | 10-25 miles | | Railroad | 20-50 miles | |
| Robert Street (5 miles) | + | + | + | + | + | + | + | + | X ⁸ | X | - | - | X | - | - |
| TH 52 (10 miles) | X | - | - | X | - | - | + | + | + | + | + | + | X | - | - |
| Concord (6 miles) | + | + | + | + | + | + | + | + | X ⁹ | X | - | - | X | - | - |
| UPRR (6 miles) | X | - | - | X | - | - | + | + | X ¹⁰ | X | - | - | + | X | - |

⁸ Constructing LRT on Robert Street while preserving existing capacity for passenger vehicles would require widening the road by two lanes through established urban neighborhoods, particularly in St. Paul and West St. Paul, resulting in substantial impacts on property and structures. These impacts would affect a large part of the market the line would be intended to serve.

⁹ Constructing LRT on Concord Street while preserving existing capacity for passenger vehicles would require widening the road by two lanes through established urban neighborhoods, particularly in St. Paul and West St. Paul, resulting in substantial impacts on property and structures. It would require shifting roadway to the east to minimize impacts on the bluff on the west side of the road in West St. Paul.

¹⁰ Constructing LRT in the UPRR railroad right-of-way would require willing participation by the railroad and construction of new LRT tracks within the existing railroad right-of-way. One of the assumptions related to LRT in the UPRR right-of-way is that there is space available that would avoid impacts outside the existing railroad footprint. However, total right-of-way is limited to 50' in one section in the northern part of the alignment and 25' in the southern part of the alignment. Construction of LRT within the existing corridor would require shifting of the existing freight track in order to accommodate two new LRT tracks (minimum 14' spacing, centerline to centerline), drainage, and service access. This has the potential to significantly impact areas that have multiple tracks, and would likely require additional right-of-way in some areas.

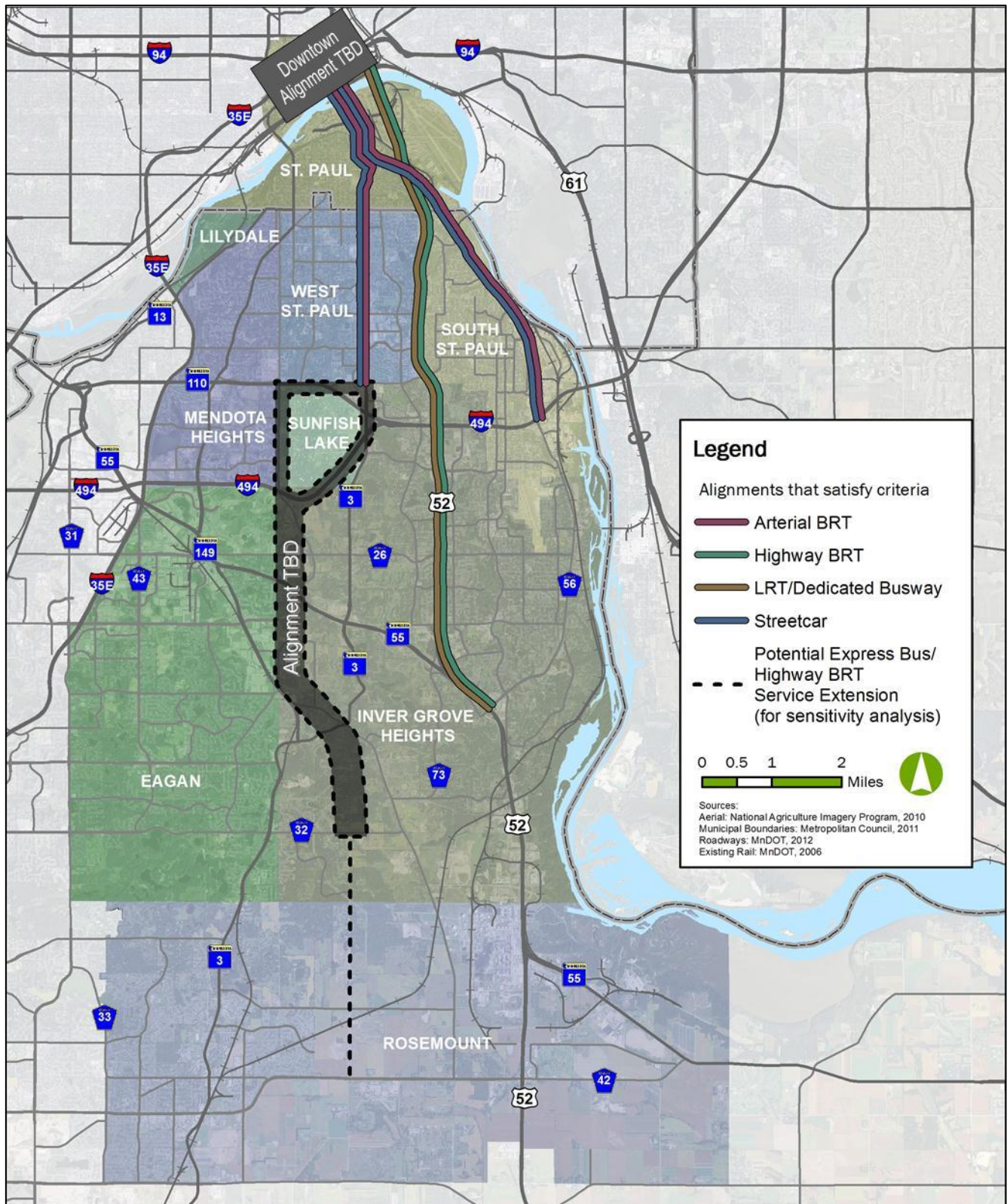


Figure 15 - Alternatives for Further Consideration

5.3. Conceptual Definition

The next step in the AA process involved conceptually defining the remaining alternatives alignments (see **Table 15**) for further study. This required identifying specific routes within the alignment, creating conceptual service plans for each mode, creating conceptual station designs and identifying station needs for each alignment/mode, identifying Operation & Maintenance Facility (OMF) needs and potential locations, and identifying possible Park & Ride Facility locations. This data was then used to compare and contrast each alternative to identify which would move on to the final phase of analysis.

Table 15 - Identified Transitway Alternatives for Study

| Alignment | Termini (North/South) | Modes | Alternative # |
|--|---|--------------------------------|---------------|
| Robert Street | Downtown St. Paul/Mendota Road or Dakota County Northern Service Center (NSC) | Arterial BRT | 1 |
| | | Modern Streetcar | 2 |
| TH 52 | Downtown St. Paul/Concord Boulevard or Inver Hills Community College (IHCC) | Highway BRT | 3 |
| | | Dedicated Busway ¹¹ | 4 |
| | | LRT | 5 |
| Concord Street | Downtown St. Paul/494 or Southview Boulevard | Arterial BRT | 6 |
| | | Modern Streetcar | 7 |
| Potential Service Extension (forwarded for sensitivity analysis) | Robert Street alignment southern terminus/UMore Park or Dakota County Technical College | Express Bus or Highway BRT | 8 |

The conceptual definitions established for all three corridors (Robert Street, TH 52 and Concord Street) are spelled out in great detail within the Conceptual Definition and Preliminary Evaluation of Alternatives technical memorandum. Readers are encouraged to review this document to better understand the alignments that were studied, characteristics of existing cross-sections within each corridor, needed characteristics for guideway cross-sections, and conceptual service plans developed for each alignment.

¹¹ Per Metro Transit guidance; defined as a transit-exclusive Busway on separate right-of-way (ROW) facility, with characteristics similar to LRT.

5.4. Conceptual Definition Criteria and Analysis

Utilizing the Conceptual Definition data identified in Section 5.3, each alignment and mode was then subjected to an analysis of high-level impacts to identify which should move on to the Final Definition stage of the AA. Alignments and modes were first differentiated based on four (4) main factors: accessibility constraints, anticipated ROW impacts, traffic impacts, and necessary capital improvement needs.¹² Following this analysis, the project team then developed a final set of evaluation measures to compare and contrast the data in order to identify the alignments most worthy of in-depth study during the Final Definition phase of the AA. The three final measures of analysis were Engineering Constraints, Capital Improvement Needs, and Ridership Potential.

Results of the analysis on the three final measures along with the resulting overall rating for each alignment and mode option studied are shown in **Table 16**.

Table 16 - Conceptual Definition Final Evaluation Scores

| | Alternatives | | | | | | |
|---------------------------|----------------------------|--------------------------------|-------------------|------------------------|-----------|-----------------------------|---------------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Engineering Constraints | Robert Street Arterial BRT | Robert Street Modern Streetcar | TH 52 Highway BRT | TH 52 Dedicated Busway | TH 52 LRT | Concord Street Arterial BRT | Concord Street Modern Streetcar |
| Engineering Constraints | ● | ● | ● | ◐ | ◐ | ◐ | ◐ |
| Ridership Potential | ◐ | ● | ○ | ○ | ○ | ○ | ◐ |
| Capital Improvement Needs | ● | ◐ | ◐ | ○ | ○ | ◐ | ◐ |
| Overall Rating | ● | ● | ◐ | ○ | ○ | ◐ | ◐ |

○ = Low performance (1 point)

◐ = Medium performance (2 points)

● = High performance (3 points)

5.4.1. Definition of Sub-Alternatives

Based on input from the Steering Committee, two sub-alternatives were introduced during the Conception Definition Phase, as described below:

¹² Please refer to the Conceptual Definition and Preliminary Evaluation Technical Memorandum for a complete breakdown of accessibility constraints, ROW impacts, traffic impacts and capital improvement needs identified for each alignment and mode.

5.4.1.1. TH 52 Highway BRT (to downtown via Cesar Chavez)

Recognizing the ridership potential along Cesar Chavez Street, a revised TH 52 Highway BRT alternative was introduced for sensitivity analysis. Between the IHCC Station and Cesar Chavez Street, this Alternative provides Highway BRT service similar to that described for the TH 52 Highway BRT Alternative. At Cesar Chavez Street, however, rather than reentering TH 52, the alignment turns west onto Cesar Chavez Street to Robert Street, where it then continues along the alignment described for the Robert Street Arterial BRT Alternative. It then returns following the same route. There are a total of 14 Highway BRT stations for this Alternative

5.4.1.2. East-West Connection

In order to test potential east-west demand between the study area and the METRO Blue Line and points west, an east-west connector route that could be added to each of the primary Alternatives was defined (referred to as Route 419). The proposed Route 419 alignment would serve the Fort Snelling METRO Blue Line LRT station and connect to each primary Alternative via MN 110 and Mendota Road.

5.5. Alternatives Advanced to Final Definition

Based upon conceptual definition and preliminary evaluation of alternatives, the Steering Committee elected to carry forward three (3) alternatives in the AA process:

- Robert Street Arterial BRT
- Robert Street Modern Streetcar
- TH 52 Highway BRT

The Steering Committee also decided to conduct a ridership sensitivity analysis of a BRT service extension to Rosemount via Eagan from the terminus of either a Robert Street alignment or a TH 52 alignment. All three alternatives selected to advance to the Final Definition Analysis and the two corridors identified for sensitivity analysis are shown on **Figure 16**.

5.5.1. Alternatives Eliminated from Consideration

Busway and LRT options for TH 52 were eliminated from further consideration due to overall low scores relating to both ridership potential and necessary capital improvement needs. And while the Concord Street corridor was shown to have medium performance nearly across the board, it was determined the alignment could not perform at a high level for any of the review criteria, so it too was eliminated from further consideration.

In addition to the main alternatives that were eliminated, the two sub-alternatives that had advanced from the Conceptual Definition stage were also eliminated following additional analysis of cost, ridership, and service planning factors, as discussed below.

The TH 52 Highway BRT Sub-Alternative that utilized Cesar Chavez was eliminated as it was deemed to serve two different markets—a *commuter market* with mobility goals to get downtown fast (along TH 52) and a *local market* with access goals to make more frequent stops with less emphasis on time savings (along Cesar Chavez to Robert Street). The project team determined that utilizing this alignment would not live up to the

expectations of either market whereas the Lafayette Bridge alternative would clearly excel at meeting commuter needs. Accordingly, only the Lafayette Bridge alternative was chosen to advance.

Additionally, the East-West Connection Sub-Alternative (Route 419) was also eliminated from consideration. Ridership forecasting results showed that it produced too little ridership to implement; additionally, it competed with the proposed transitway Alternatives and thus failed to enhance project ridership.

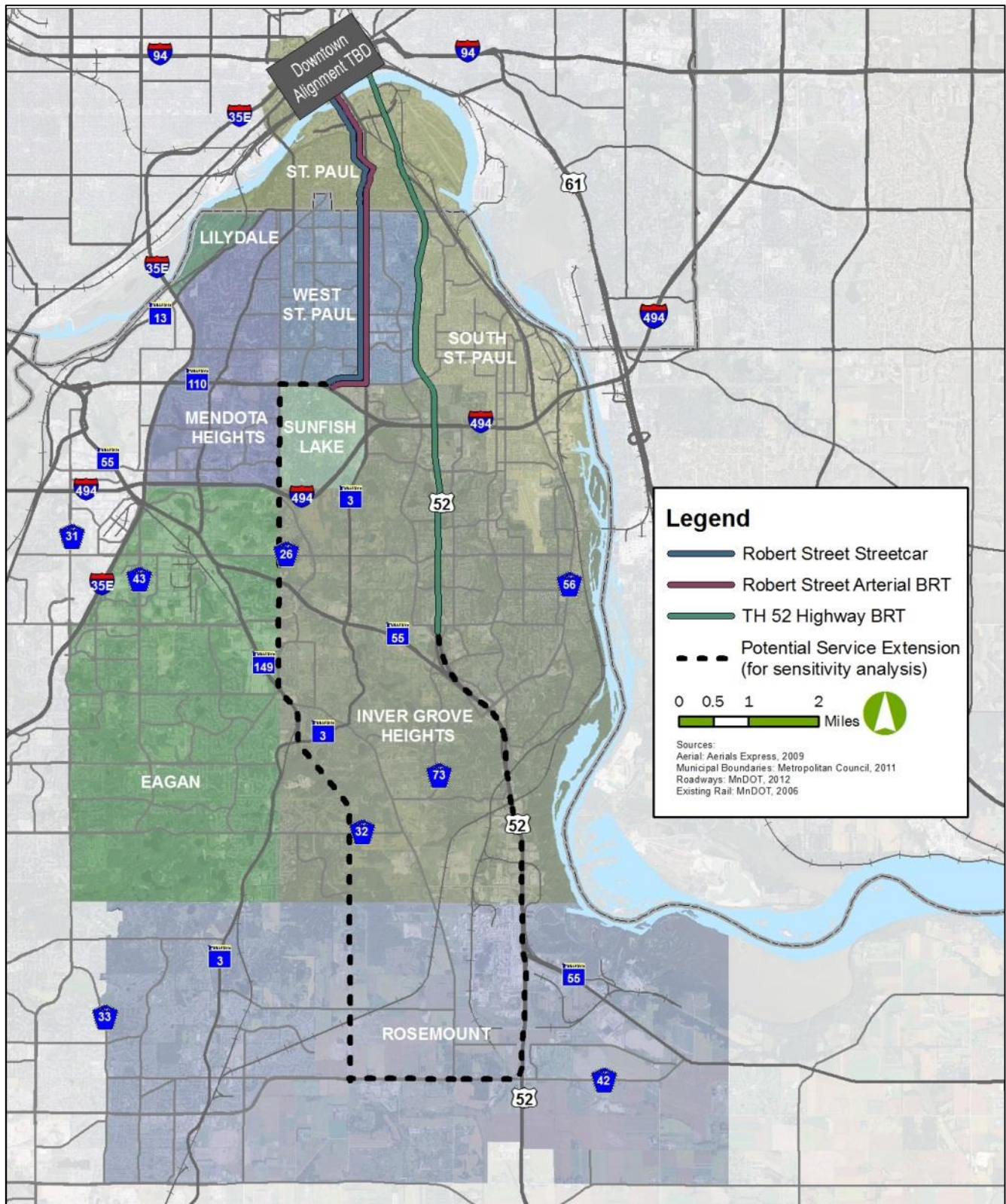


Figure 16 - Potential Park and Ride Locations

5.6. Sensitivity Analysis for Potential Service Extensions

Before proceeding to the Final Definition portion of the AA, a ridership sensitivity analysis was completed for three (3) service options as shown in **Table 17**.

Table 17 - Service Extension Alternatives Identified for Sensitivity Analysis

| Service Extension | Alignment and Southern Terminus | Mode | Extension Length |
|-------------------|---|--------------|------------------|
| Robert Street | Robert Street alignment to UMore Park/Dakota County Technical College via multiple roadways | Arterial BRT | 12 Miles |
| TH 52 | TH 52 alignment to UMore Park/Dakota County Technical College via TH 52 | Highway BRT | 8 Miles |
| TH 52 | TH 52 alignment to UMore Park or Dakota County Technical College via TH 52 | Express Bus | 8 Miles |

The ridership sensitivity tests were completed by analyzing the identified alignment extensions, modes, and socioeconomic data gathered for the year 2030. Ridership for the service extension alignments was estimated both with and without the proposed UMore Park Development¹³. Given the additional length of each corridor, there would be a corresponding increase in capital as well as operating and maintenance costs. The increase in costs would not likely be at a ratio of 1 to 1 over the length of the extension given lower station density and faster per mile travel times, so a target of a 75 percent increase in ridership was set to justify further study of each extension. As none of the three extensions were able to demonstrate such an increase, all were eliminated from further consideration at this point in time.

¹³ Please refer to the UMore Park BRT Service Extension Sensitivity Analysis Technical Memorandum for UMore Park development data.

6. Alternative Definition

To initiate the Final Definitions stage of the AA, each of the three (3) final alternatives to make it past preliminary and conceptual definition analysis (see **Table 18**) first underwent further refinement to alignments, stations, typical cross-sections, preliminary service planning, conceptual station designs, and candidate operations and maintenance facility (OMF) sites where necessary.¹⁴ Section 6 of this Final Report outlines the final alignment characteristics, station details, and service plans for each alternative studied. Further detail on corridor cross-sections and the information outlined herein can be found within the Final Definition and Evaluation of Alternatives Technical Memorandum.

Table 18 - Alternatives Advanced to Final Definition

| Alignment | Mode | Miles | Cost* | Cost per Mile* |
|----------------------|------------------|------------|-----------------|---------------------|
| Robert Street | Arterial BRT | 5.8 miles | \$27.5 million | \$4.7 million/mile |
| | Modern Streetcar | 5.4 miles | \$373.1 million | \$69.2 million/mile |
| TH 52 | Highway BRT | 10.7 miles | \$46.1 million | \$4.3 million/mile |

*2013 Dollars

6.1. Robert Street Arterial BRT Definition

The Robert Street Arterial BRT alternative (shown in **Figure 17**) extends 5.8 miles between Mendota Road in West St. Paul and downtown St. Paul. The alignment begins at a new park-and-ride facility near the Northern Service Center along Mendota Road in West St. Paul and continues east to Robert Street. It then continues north on Robert Street to State Street, where it follows State Street to Cesar Chavez Street. It heads northwest on Cesar Chavez Street to Robert Street, where it continues north on Robert Street into downtown.

The conceptual downtown routing alignment used for AA evaluation follows Robert Street before turning east onto 5th Street and then south onto Broadway Street. The alignment then enters the Union Depot Station before returning north on Broadway Street until 6th Street where it turns west. It then turns south on Robert Street and follows the same route back to the Northern Service Center on Mendota Road. Arterial BRT buses are planned to operate in mixed traffic along the corridor.

¹⁴ Detailed assumptions regarding service planning and conceptual engineering are provided in the Final Service Plan Technical Memorandum and Cost Estimation Technical Memorandum. Additionally, a full analysis of evaluated downtown routing options can be found in the Downtown Routing Technical Memorandum.

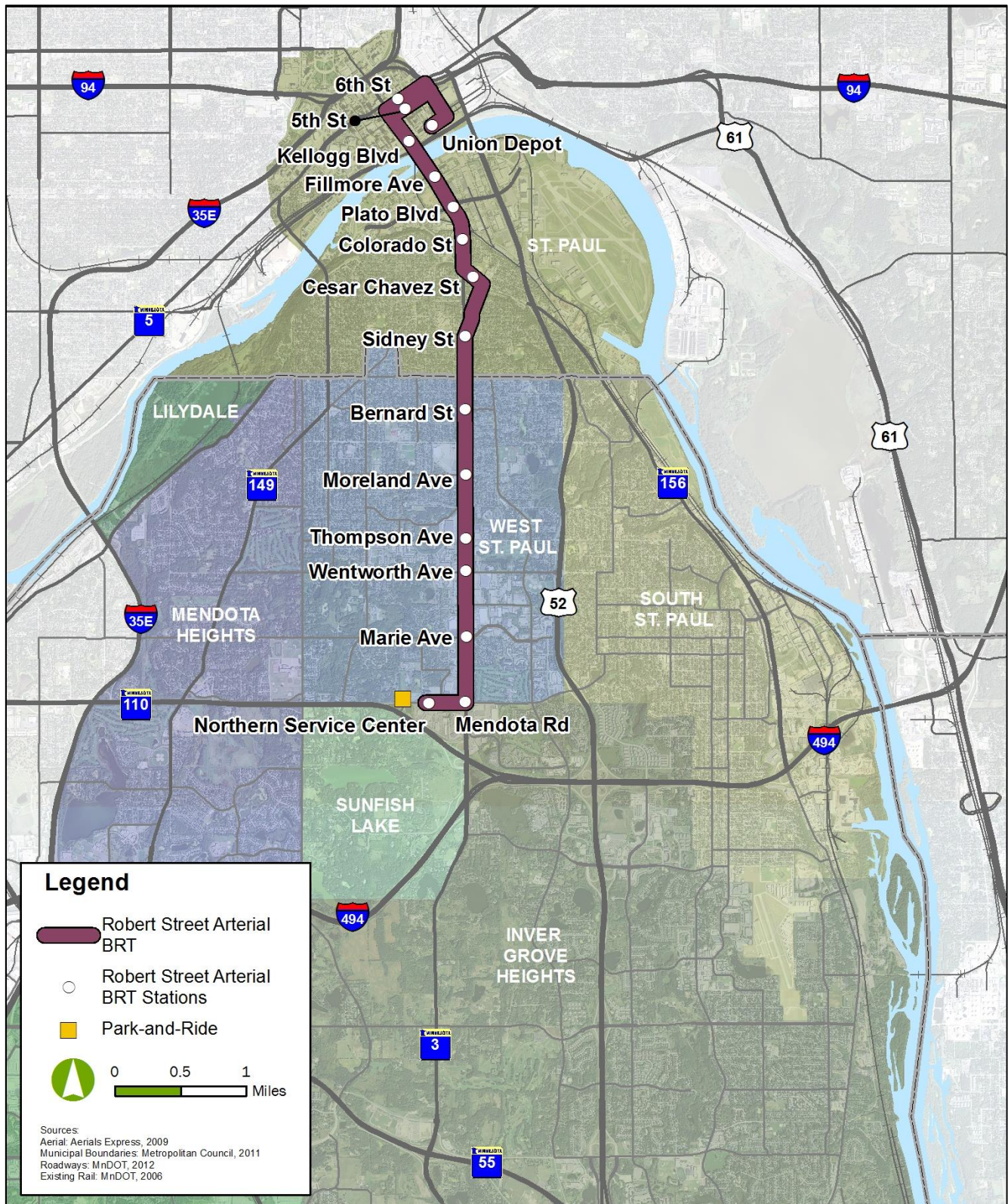


Figure 17 - Robert Street Arterial BRT Alignment and Stations

The Robert Street Arterial BRT Alternative would include 16 stops with 28 total stations. This includes one new park-and-ride facility at the southern terminus near the Northern Service Center along Mendota Road in West St. Paul that provides an additional 350 parking stalls for transitway users. Stations include transitway-level amenities including raised curbs for ease of boarding, a comfortable and attractive shelter, ticket vending machine (TVM)¹⁵, real-time electronic signage, bike rack, trash receptacle, emergency phone, and security camera. **Figure 18** shows a conceptual station design for the Robert Street Arterial BRT Alternative.

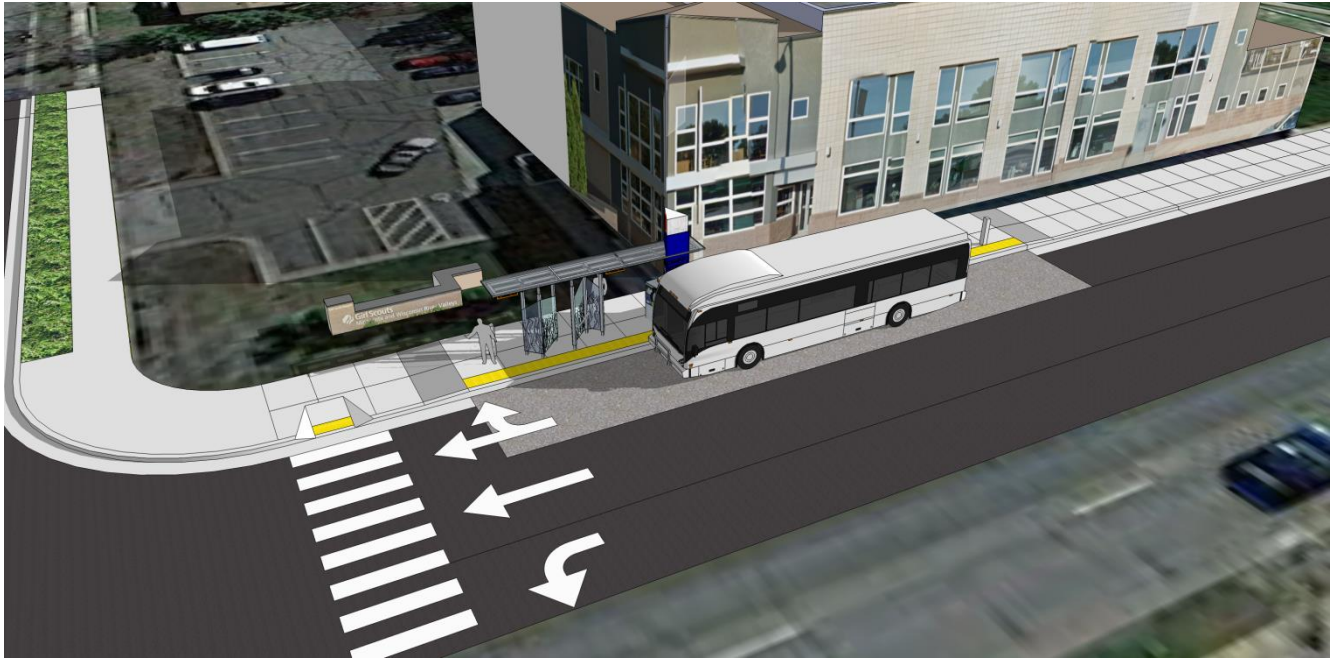


Figure 18 - Robert Street Arterial BRT Conceptual Station Design

The Robert Street Arterial BRT Alternative included the following service plan improvements and/or changes to provide maximum transit connectivity:

- A mainline arterial BRT service operating between Union Depot and the Northern Service Center would be established.
- A mainline local bus service operating between Union Depot and the Northern Service Center on Robert Street with existing local bus stop spacing would also be established.
- Current bus Route 75 would be reconstituted as three routes:
 - *Much of the Route 75 service (includes branches serving Livingston Avenue and 54th Street/Alta Avenue) would be discontinued and replaced with the new mainline arterial BRT service.*
 - *The Route 75 Parkview Avenue branch would remain as is, providing a connection to the Robert Street Arterial BRT at the Moreland Avenue station.*

¹⁵ TVM's are provided at each station location, except at locations where extra small shelters are provided in both the NB and SB directions (arterial BRT only).

- *The Route 75 Inver Hills Community College (IHCC) shuttle is a proposed new service. This route would operate from the Northern Service Center arterial BRT station to IHCC, with the alignment serving most of the former Route 75 54th Street/Alta Avenue branch south of Mendota Road, and then using TH 52 to travel south.*
- *The Route 75 Stryker Avenue branch is another proposed new service. This route would operate between downtown St. Paul and the Moreland Avenue arterial BRT station where it will connect with the arterial BRT routes for continuing service to downtown St. Paul. This route would serve as a replacement for service on Stryker Avenue and Wabasha Street lost by discontinuing the existing/longer Route 75.*
- Local bus Route 68 would also be reconstituted as three routes:
 - *Route 68 Thompson Avenue would operate between the Thompson Avenue arterial BRT station and locations south in South St. Paul and Inver Grove Heights, maintaining its current frequency.*
 - *Route 68 Marie Avenue would remain as is, operating between Camelot Street/California Avenue in St. Paul, through the Robert Street corridor, and then serving locations south on its current frequency and alignment. When Route 68 Marie Avenue travels on Robert Street, it would serve all local stops including all arterial BRT stations.*
 - *Route 68 Jackson Street would be instituted as a replacement service to provide additional trips between Camelot Street/California Avenue and downtown Saint Paul in order to replace trips lost due to the truncation of Route 68 Thompson Avenue.*

Figure 19 shows the proposed Robert Street Arterial BRT service plan.

Under this service plan, a total of seven bus trips an hour (four arterial BRT and three local bus) would operate on the Robert Street corridor each weekday, with five of those trips extending south to the Northern Service Center. Three additional routes (68 Thompson Avenue, 75 Stryker Avenue, and 75 IHCC Shuttle) would serve as connecting bus services, ending at Robert Street and providing a transfer to the mainline arterial BRT service. Detailed service characteristics for the Robert Street Arterial BRT alignment are summarized in **Table 19**.

Table 19 - Robert Street Arterial BRT Proposed Service Characteristics

| | Weekday | | | | | | | Saturday | | Sunday | | One-way Route Distance (miles) | End to End Travel Time (min) | Connecting Station |
|-----------------------|-----------------|---------|--------|---------|---------|------------|-----------------------|-----------|-----------------------|-----------|-----------------------|--------------------------------|------------------------------|--------------------------|
| | Frequency (min) | | | | | | Span of Service (hrs) | Frequency | Span of Service (hrs) | Frequency | Span of Service (hrs) | | | |
| | Early AM | AM Peak | Midday | PM Peak | Evening | Late Night | | | | | | | | |
| Mainline arterial BRT | 60 | 15 | 15 | 15 | 15 | - | 18 | 30 | 18 | 30 | 16 | 5.8 | 30 | |
| Mainline local bus | 60 | 60 | 60 | 60 | 60 | - | 18 | 60 | 18 | 60 | 16 | 5.8 | * | |
| Route 68 Marie | 30 | 30 | 30 | 30 | 30 | 60 | 20 | 40 | 18 | 40 | 16 | 12.7 | * | |
| Route 75 IHCC shuttle | 60 | 60 | 60 | 60 | 60 | - | 16 | - | - | - | - | 6.5 | * | Northern Service Center |
| Route 75 Stryker | 45 | 45 | 45 | 45 | 45 | - | 16 | - | - | - | - | 3.7 | * | Moreland |
| Route 68 Thompson | 45 | 30 | 45 | 30 | - | - | 13 | 60 | 12 | 60 | 10 | 10.9 | * | Thompson |
| Route 68 Jackson | 30 | 30 | 30 | 30 | 30 | 60 | 20 | 30 | 18 | 60 | 16 | 4.7 | * | 6 th /Jackson |

**Denotes routes where travel time was determined by regional travel demand model*

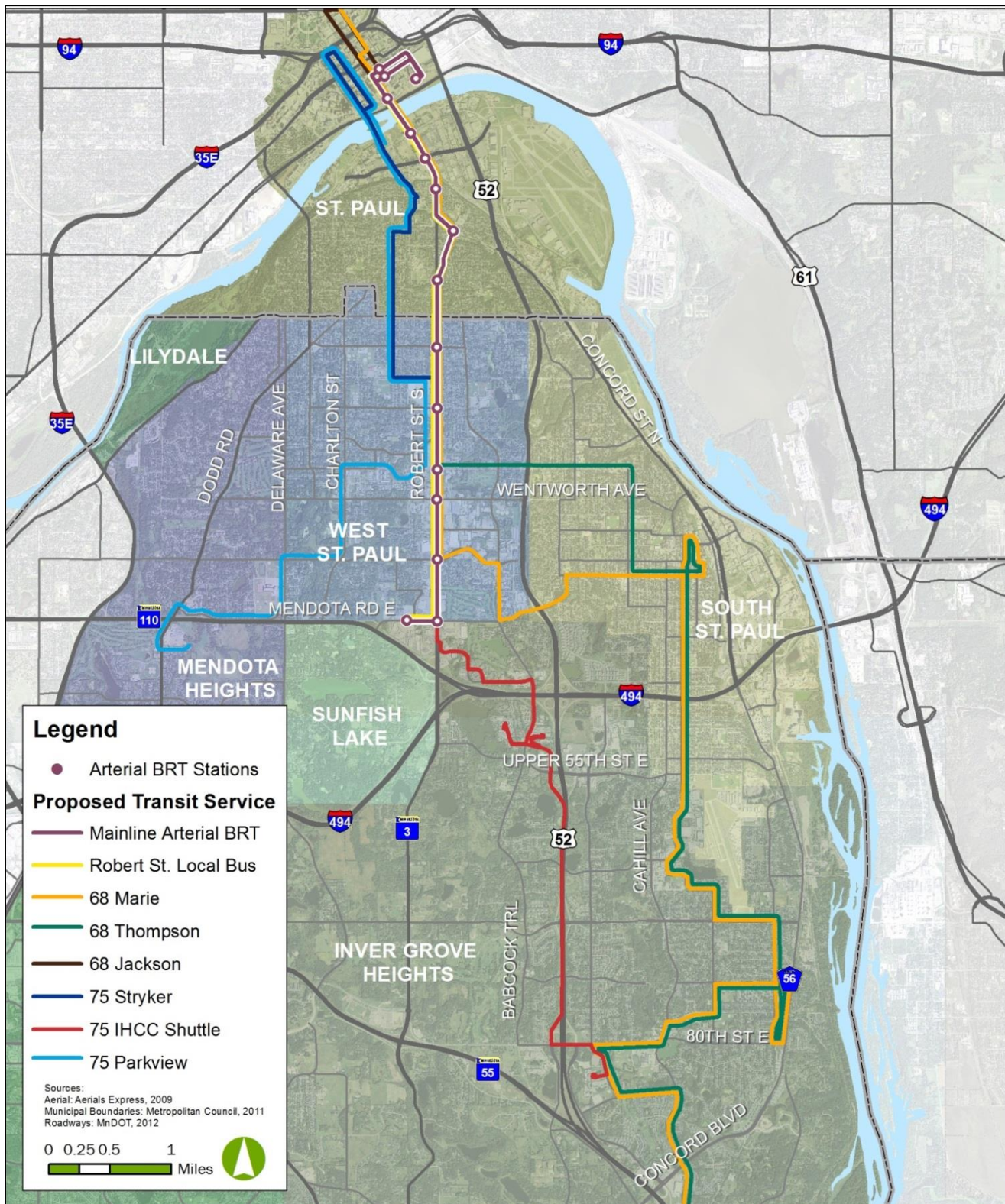


Figure 19 - Robert Street Arterial BRT Proposed Transit Service

6.2. Robert Street Modern Streetcar Definition

The Robert Street Modern Streetcar Alternative extends 6.5 miles between a new park-and-ride facility in West St. Paul and downtown St. Paul. It follows the same alignment as the Robert Street Arterial BRT Alternative from the Northern Service Center Station to downtown St. Paul. The conceptual downtown routing alignment used for AA evaluation varies slightly between the two Alternatives. The Robert Street Modern Streetcar Alternative is planned to follow Robert Street before turning east onto 5th Street and north onto Wacouta Street instead of going to the Union Depot. The alignment then turns west onto 6th Street and returns to the Northern Service Center by following the same route. Streetcars are planned to operate in mixed traffic along the corridor.

The Robert Street Modern Streetcar Alternative includes 21 stops with 38 total stations (see **Figure 21**). This includes one new park-and-ride facility at the southern terminus near the Northern Service Center along Mendota Road in West St. Paul that provides an additional 350 parking stalls for transitway users.

Stations include transitway-level amenities including raised curbs for ease of boarding, a comfortable and attractive shelter, TVM, real time electronic signage, bike rack, trash receptacle, emergency phone, and security camera. **Figure 20** shows a conceptual station design for the Robert Street Modern Streetcar Alternative.



Figure 20 - Robert Street Modern Streetcar Conceptual Station Design

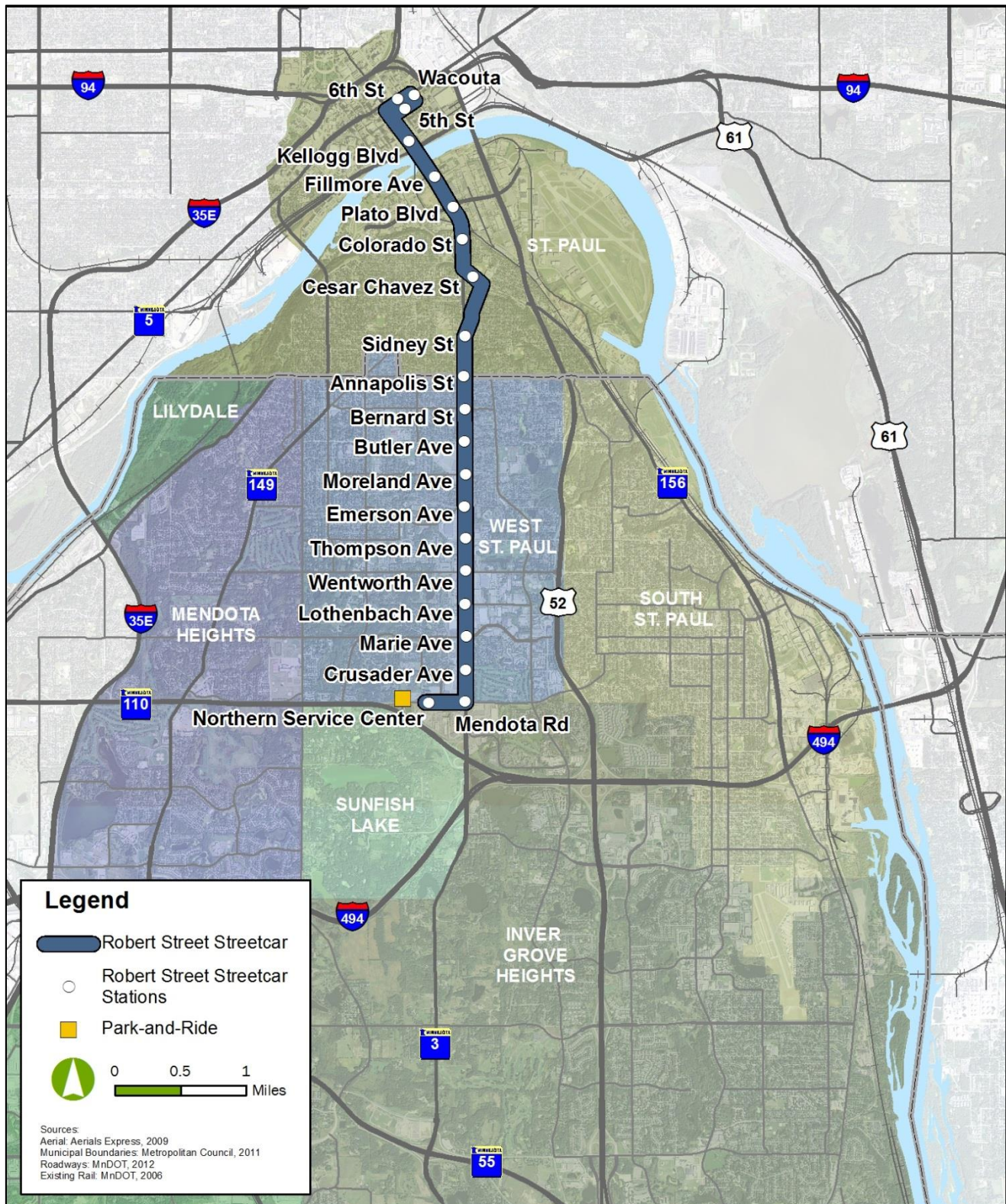


Figure 21 - Robert Street Streetcar Alignment and Stations

The Robert Street Modern Streetcar Alternative included the following service plan improvements and/or changes to provide maximum transit connectivity:

- A mainline streetcar service operating between Union Depot and the Northern Service Center would be established.
- A mainline limited stop bus service operating between Union Depot and the Northern Service Center would also be established (see **Figure 23**). This route would be limited stop, operating approximately four minutes faster than the streetcar service. It would be provided for riders who desire a faster, direct trip to downtown St. Paul instead of the slower and more accessible streetcar line.
- Current bus Route 75 would be reconstituted as three routes:
 - *Much of the Route 75 service (includes branches serving Livingston Avenue and 54th Street/Alta Avenue) would be discontinued and replaced with new service.*
 - *The Route 75 Parkview Avenue branch would remain as is, providing a connection to the Robert Street Modern Streetcar Alternative at Moreland Avenue station.*
 - *The Route 75 IHCC shuttle is a proposed new route that will operate from the Northern Service Center streetcar station to IHCC, with the alignment serving most of the former 54th Street/Alta Avenue branch south of Mendota Road, and then using TH 52 to travel south.*
 - *Another proposed new service is the Route 75 Stryker Avenue branch. This route would operate between downtown St. Paul and the Moreland Avenue streetcar station, where it would connect with the streetcar service to provide passengers with continuing service to downtown St. Paul. This route would serve as a replacement for service on Stryker Avenue and Wabasha Street lost by discontinuing the existing/longer Route 75.*
- Local bus Route 68 would also be reconstituted as three routes:
 - *Route 68 Thompson Avenue would operate between the Thompson Avenue streetcar station and locations south in South St. Paul and Inver Grove Heights, maintaining its current frequency.*
 - *Route 68 Marie Avenue would remain as is, operating between Camelot Street/California Avenue in St. Paul, through the Robert Street corridor, and then serving locations south on its current frequency and alignment. When Route 68 Marie Avenue travels on Robert Street, it would serve all local stops including all streetcar stations.*
 - *Route 68 Jackson Street would be instituted as a replacement service in order to provide additional trips between Camelot Street/California Avenue and downtown St. Paul lost with the truncation of Route 68 Thompson Avenue.*

Under the service plan for Robert Street Modern Streetcar, a total of seven transit trips an hour (four streetcar and three local bus) would operate on the Robert Street corridor each weekday, with five of those trips extending all the way to the Northern Service Center. Three additional routes (68 Thompson Avenue, 75 Stryker Avenue, and 75 IHCC Shuttle) would provide connecting bus services, serving a Robert Street streetcar station and providing a transfer to the mainline transit service. Detailed service characteristics for the Robert Street Modern Streetcar alignment are summarized in **Table 20**.

Table 20 - Robert Street Modern Streetcar Proposed Service Characteristics

| | Weekday | | | | | | | Saturday | | Sunday | | One-way Route Distance (miles) | End to End Travel Time (min) | Connecting Station |
|---------------------------|-----------------|---------|--------|---------|---------|------------|-----------------------|-----------|-----------------------|-----------|-----------------------|--------------------------------|------------------------------|--------------------------|
| | Frequency (min) | | | | | | Span of Service (hrs) | Frequency | Span of Service (hrs) | Frequency | Span of Service (hrs) | | | |
| | Early AM | AM Peak | Midday | PM Peak | Evening | Late Night | | | | | | | | |
| Mainline Streetcar | 60 | 15 | 15 | 15 | 15 | - | 18 | 30 | 20 | 30 | 16 | 5.4 | 29 | |
| Mainline limited stop bus | 60 | 60 | 60 | 60 | 60 | - | 18 | 60 | 20 | 60 | 16 | 5.8 | 25 | |
| Route 68 Marie | 30 | 30 | 30 | 30 | 30 | 60 | 20 | 40 | 20 | 40 | 16 | 12.7 | * | |
| Route 75-IHCC shuttle | 60 | 60 | 60 | 60 | 60 | - | 16 | - | - | - | - | 6.5 | * | Northern Service Center |
| Route 75 Stryker | 45 | 45 | 45 | 45 | 45 | - | 16 | - | - | - | - | 3.7 | * | Moreland |
| Route 68 Thompson | 45 | 30 | 45 | 30 | - | - | 13 | 60 | 12 | 60 | 10 | 10.9 | * | Thompson |
| Route 68 Jackson | 30 | 30 | 30 | 30 | 30 | 60 | 20 | 30 | 18 | 60 | 16 | 4.7 | * | 6 th /Jackson |

**Denotes routes where travel time was determined by regional travel demand model*

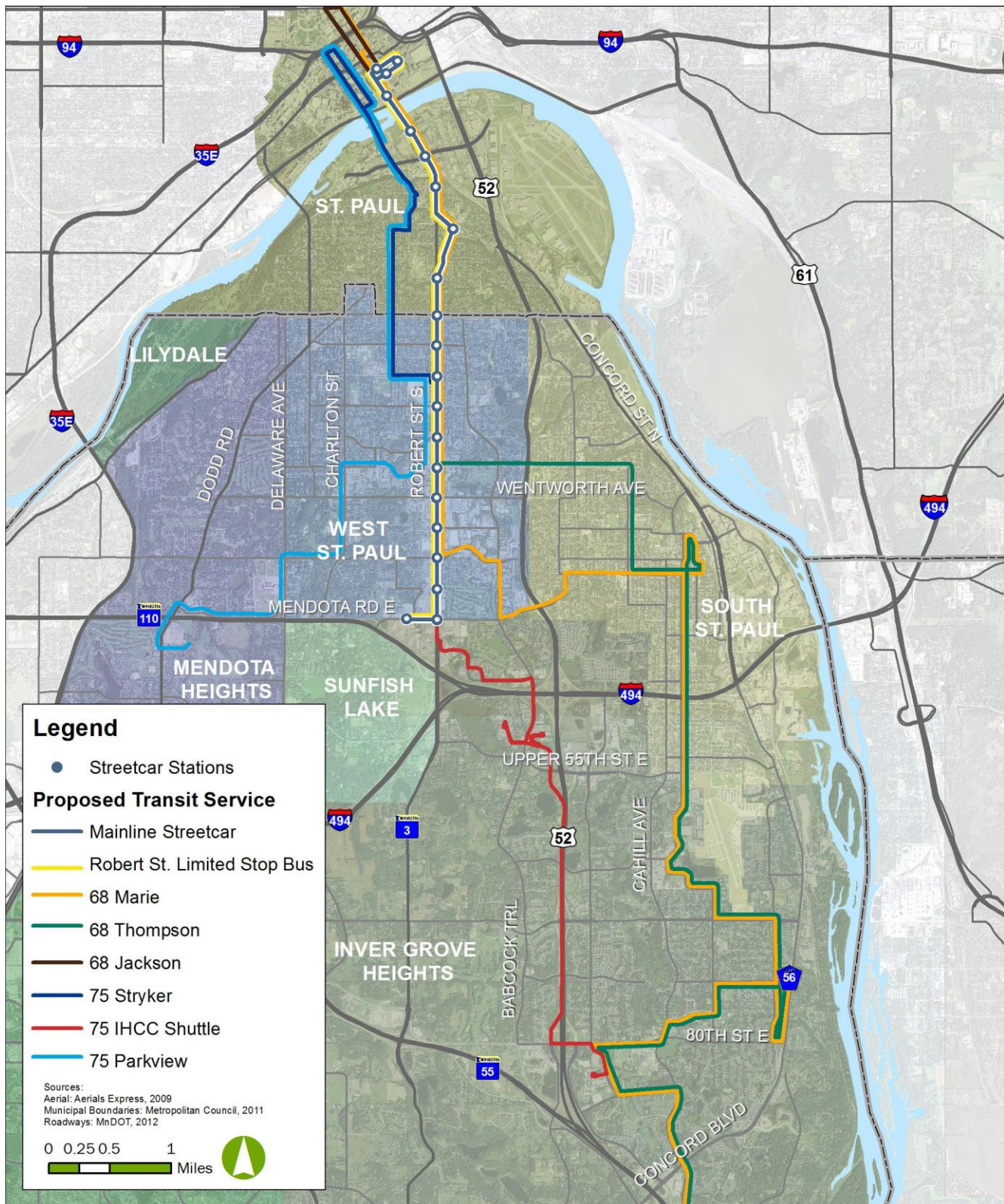


Figure 22 - Robert Street Modern Streetcar Proposed Transit Service

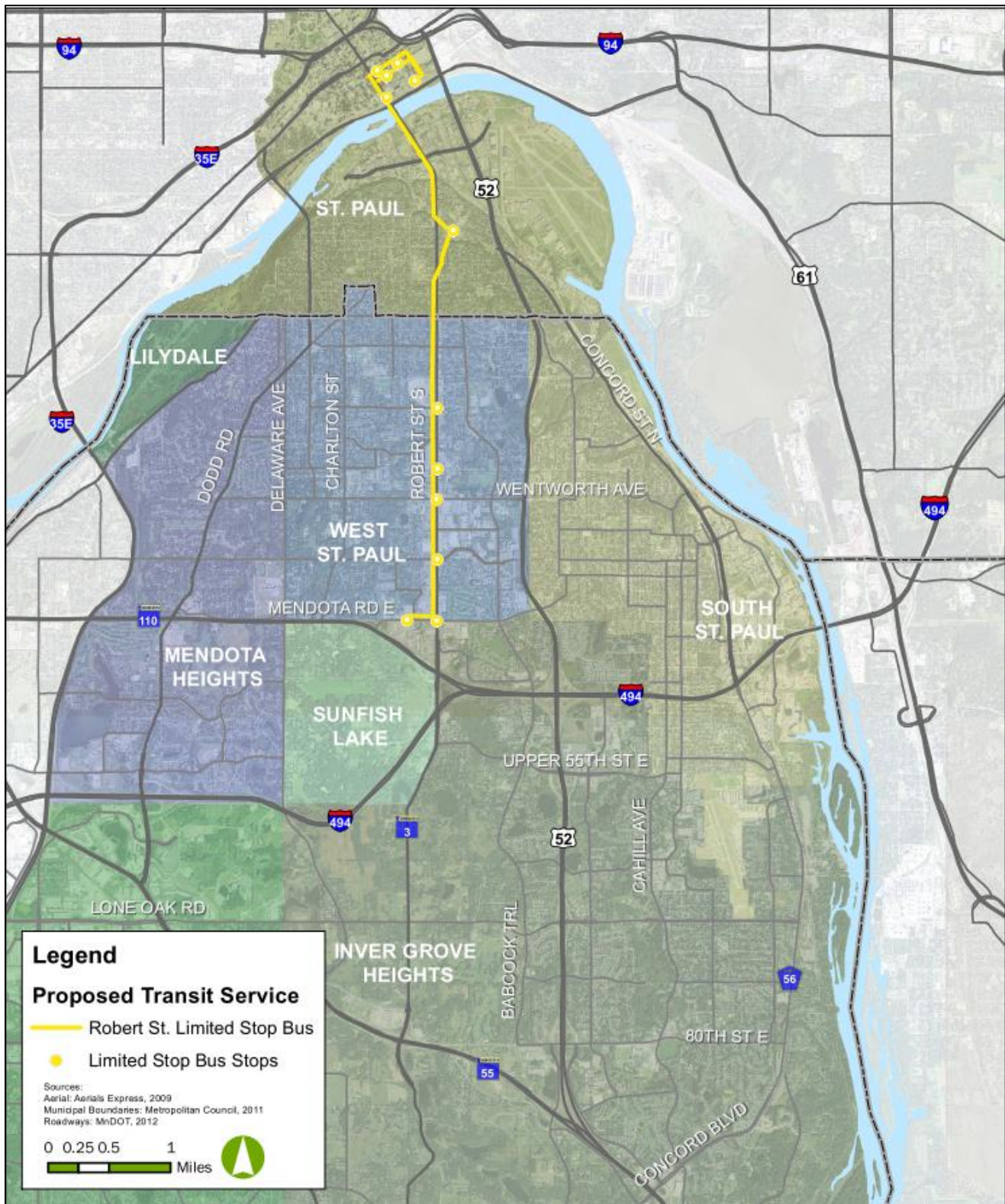


Figure 23 - Proposed Robert Street Limited Stop Bus Service

6.3. TH 52 Highway BRT Definition

The TH 52 Highway BRT Alternative extends 9.1 miles between a new park-and-ride facility in Inver Grove Heights and downtown St. Paul. The alignment begins at the proposed park-and-ride station near the Inver Hills Community College and enters TH 52 from 80th Street. It continues north on TH 52 where it exits at 70th Street for inline stations on the off-ramps before continuing north on TH 52. It again exits at Upper 55th Street for inline stations on the off-ramps before returning to TH 52. The alignment next exits at Southview Boulevard/Mendota Road for inline stations on the off-ramps. It continues north on TH 52 until exiting at Wentworth Avenue and continuing along the frontage road to an inline station at Thompson Avenue. The alignment enters TH 52 from Thompson Avenue before again exiting at Butler Avenue for inline stations on the off-ramps before continuing north on TH 52. It then exits at Concord Street/Cesar Chavez Street for inline stations on the off-ramps, and continues north on TH 52 into downtown.

The conceptual downtown routing alignment used for AA evaluation enters downtown via the Lafayette bridge to 7th Street. The alignment then turns south on Wacouta Street, east on 5th Street, and south on Broadway Street before terminating at the Union Depot. It then returns on Broadway Street to the Lafayette Bridge and travels south on TH 52 following the same route. Highway BRT buses are planned to operate on improved shoulders on TH 52 and in mixed traffic on off/on-ramps and in downtown St. Paul.

The TH 52 Highway BRT Alternative includes 8 stops with 13 total stations. This includes one new park-and-ride facility at the southern terminus near the Inver Hills Community College in Inver Grove Heights that provides an additional 250 parking stalls for transitway users. **Figure 25** shows the station locations.

Stations include transitway-level amenities including a comfortable and attractive shelter, TVM, real time electronic signage, bike rack, trash receptacle, emergency phone, and security camera. **Figure 24** shows a conceptual station design for the TH 52 Highway BRT Alternative.



Figure 24 - TH 52 Highway BRT Conceptual Station Design

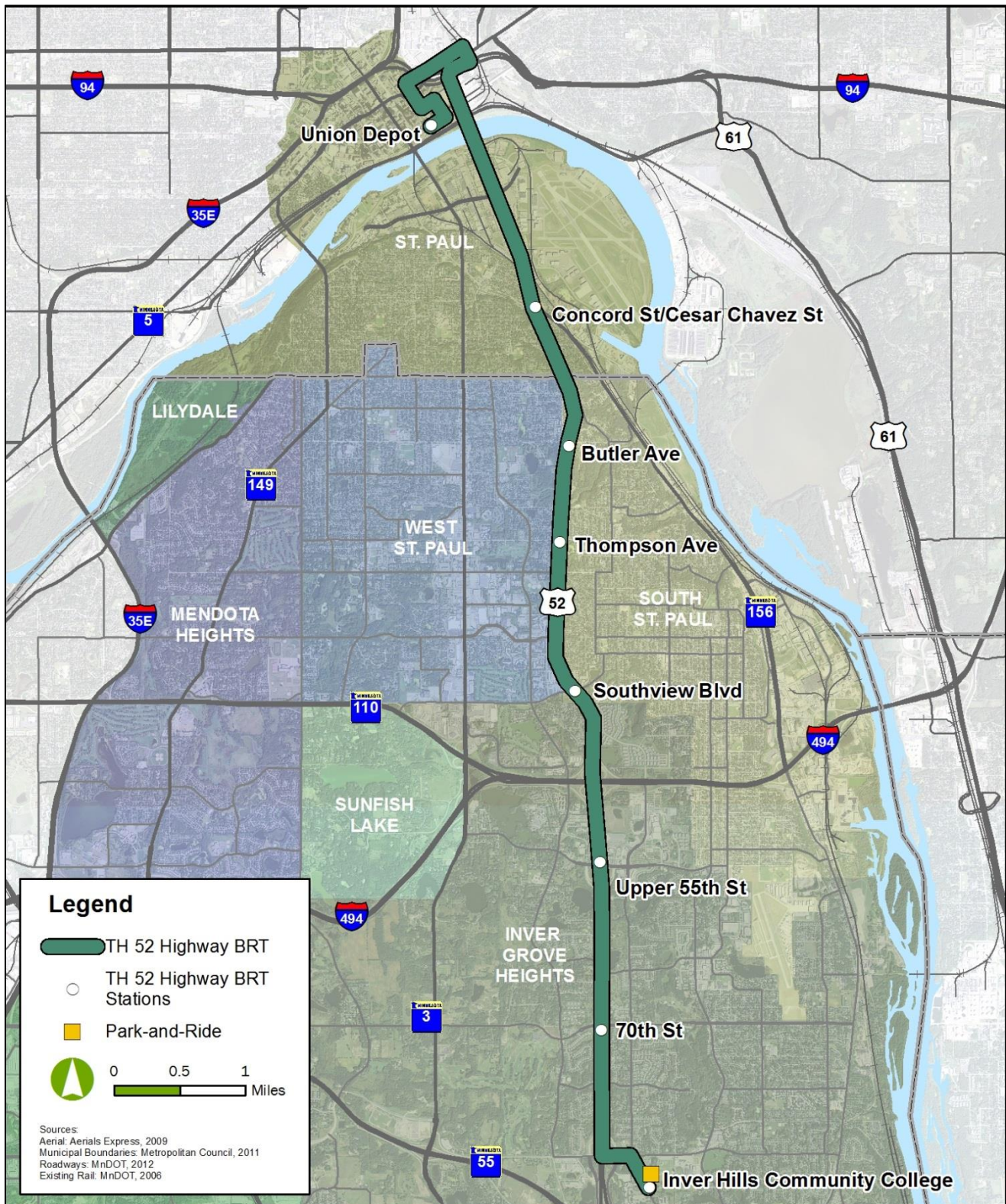


Figure 25 - TH 52 Highway BRT Alignment and Stations

The TH 52 Highway BRT service plan was far simpler than the Robert Street transitway alternatives as it included a single mainline highway BRT service and did not require additional changes to the existing local transit system. Detailed service characteristics for the TH 52 Highway BRT alignment are summarized in **Table 21**.

Table 21 - TH 52 Highway BRT Proposed Service Characteristics

| | Weekday | | | | | | | Saturday | | Sunday | | One-way Route Distance (miles) | End to End Travel Time (min) |
|-------------------|-----------------|---------|--------|---------|---------|------------|-----------------------|-----------|-----------------------|-----------|-----------------------|--------------------------------|------------------------------|
| | Frequency (min) | | | | | | Span of Service (hrs) | Frequency | Span of Service (hrs) | Frequency | Span of Service (hrs) | | |
| | Early AM | AM Peak | Midday | PM Peak | Evening | Late Night | | | | | | | |
| TH 52 Highway BRT | 60 | 10 | 15 | 10 | 15 | - | 18 | 30 | 20 | 30 | 17 | 10.7 | 24 |

6.4. Service Plan Comparisons

General characteristics of each alignment service plan can be summarized as follows:

- The Robert Street Arterial BRT Alternative is planned to operate 18 hours a day Monday through Saturday, with 16 hours of service on Sundays. Buses would arrive every 10 minutes during the peak period and every 15 minutes during the off-peak period. This is a composite frequency that includes a local bus overlay.
- The Robert Street Modern Streetcar Alternative is planned to operate 18 hours a day Monday through Friday, with 20 hours of service on Saturdays and 16 hours of service on Sundays. Streetcars would arrive every 10 minutes during the peak period and every 15 minutes during the off-peak period. This is a composite frequency that includes a limited stop bus overlay.
- The Robert Street Highway BRT Alternative is planned to operate 18 hours a day Monday through Friday, with 20 hours of service on Saturdays and 17 hours of service on Sundays. Buses would arrive every 10 minutes on weekdays and every 30 minutes on weekends.

The general service plan characteristics for each route are displayed in **Table 22**.

Table 22 - General Alignment Service Plan Characteristics

| | Distance | Travel Time | Stops | Ave. Station Spacing | Weekday Span of Service | Frequency | |
|--------------------------------|------------|-------------|-------|----------------------|-------------------------|------------|------------|
| | | | | | | Weekday | Weekend |
| Robert Street Arterial BRT | 5.8 miles | 30 minutes | 16 | ¼ - ½ mile | 18 hours | 15 minutes | 30 minutes |
| Robert Street Modern Streetcar | 5.4 miles | 29 minutes | 21 | ¼ mile | 18 hours | 15 minutes | 30 minutes |
| TH 52 Highway BRT | 10.7 miles | 24 minutes | 8 | 1 mile | 18 hours | 10 minutes | 30 minutes |

6.5. Downtown Routing

In order to develop cost estimates, travel times, and ridership estimates, a single downtown routing option was assumed for each alternative. However, ongoing and future work will be necessary to finalize the routing of any alternative within downtown St. Paul. Specific downtown routes studied as part of the Final Definitions analysis can be reviewed in detail within the **Downtown Routing Technical Memorandum**.

7. Technical Analysis

Having fully defined all aspects of the routes to be analyzed, seven (7) individual technical memorandums were then prepared to identify all data necessary to compare and contrast the options. Each of these memoranda and their primary technical findings are shown in **Table 23**. Readers are encouraged to consult each of these memoranda as needed to see methodologies used and the in-depth processes that went into arriving at all data used to evaluate the alternatives.

Table 23 - Technical Analysis Memoranda & Primary Findings

| Study Component | Primary Findings |
|---|--|
| UMore Park Sensitivity Analysis Technical Memorandum | <ul style="list-style-type: none"> Sensitivity test results for Robert Street and TH 52 service extensions showed that neither would increase ridership enough to justify their continued consideration |
| Cost Estimation Technical Memorandum | <ul style="list-style-type: none"> Fully defined and documented the methods used to estimate capital costs and operating and maintenance (O&M) costs associated with each alternative |
| Environmental and Social Considerations Technical Memorandum | <ul style="list-style-type: none"> Identification of specific benefits, impacts, and opportunities for each alternative relating to the issues of economic development and land use, mobility, traffic operations, environmental and natural resource concerns, and environmental justice |
| Final Service Planning Technical Memorandum | <ul style="list-style-type: none"> Fully defined all details relating to service plans for each alternative (including service improvements and changes) |
| Travel Demand Forecasting Technical Memorandum | <ul style="list-style-type: none"> Presented the final travel demand forecasting assumptions and results broken down into a summary of alternatives, forecast results and sensitivity analysis |
| Final Definition and Evaluation Technical Memorandum | <ul style="list-style-type: none"> Established the final definition of alternatives being studied by incorporating data and findings from all of the technical memoranda |
| Detailed Economic Development Analysis Technical Memorandum | <ul style="list-style-type: none"> Identified the economic development potential of each alternative |

8. Alternative Evaluation

With the final alignments fully defined and all technical analysis complete, the study then moved into final evaluation.

8.1. Methodology Review

The overall process for alternative evaluation (based on technical analysis and local, regional, and federal guidance) was refined by the steering committee into a five-step methodology implemented over the course of the study.

- **Step (1) was the adoption of project goals and objectives.** As detailed earlier in **Table 9**, the project aims to:
 - Improve mobility and accessibility
 - Enhance the effectiveness of transit service within the corridor
 - Provide cost effective and financially feasible transit solutions
 - Support and enhance existing communities and planned development
 - Support healthy communities and sound environmental practices
- **Step (2) was the identification of evaluation measures.** In addition to adopting project goals and objectives in the scoping phase of AA development, one to three evaluation measures were identified for each project objective (also shown in **Table 9**). Evaluation measures were further refined throughout project development. FTA New Starts and Small Starts project justification criteria and the Metropolitan Council Regional Transitway Guidelines capital investment criteria were consulted to inform the development of evaluation measures at the national and regional levels. In addition, evaluation measures were brought through a public process prior to final analysis.
- **Step (3) was the establishment of a scoring system.** A detailed, five-point scoring system was developed to capture Alternative performance against evaluation measures, objectives, and goals.
- **Step (4) was the identification of breakpoints.** Raw values were converted a standard five-point scale using the 60th, 70th, 80th, and 90th percentiles of maximum raw values for project benefits and opportunities, and the 20th, 40th, 60th, and 80th percentiles of the highest cost or greatest impact for project costs and impacts.
- **Step (5) was the aggregation of scores to determine overall technical performance.** To determine an overall score for each Alternative, the five project goals were weighted equally; within a given goal, objectives were weighted equally; and within a given objective, evaluation measures were weighted equally.

Figure 26 illustrates the overall scoring aggregation process.

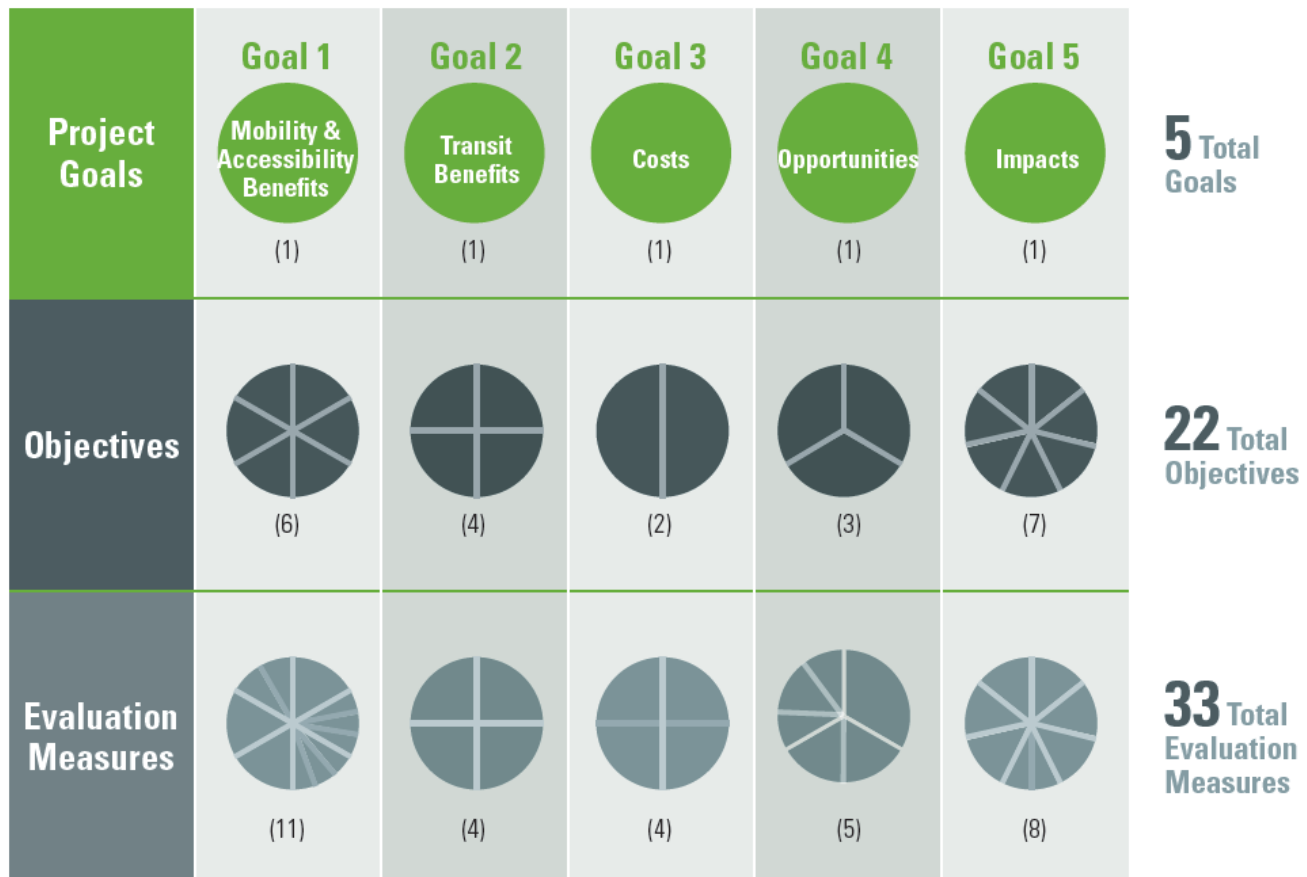


Figure 26 - Scoring Aggregation Process

8.2. Results by Evaluation Measures and Objectives

Final alternative evaluation was completed utilizing a five-point scale to evaluate alternative performance. Each project objective was assigned one to three evaluation measures that were used to score alternative performance against identified goals and objectives using the rankings of high, medium-high, medium, medium-low, or low. Objective-level scores were equally-weighted to determine a score for each project goal, and goal-level scores were equally weighted to determine an overall technical score for each alternative.

Through the analysis, certain objectives yielded scores that identified clear differences between the alternatives. The following summarizes these findings, describes why the identified measures are key, classifies the range between the three alternatives, and explains which alternative performed best for that measure.

The five-point scoring system that was used is illustrated in **Table 24**.

Table 24 - Definition of Scoring Symbols and Values

| Symbol | Definition | Value |
|---|-------------------------|-------|
|  | High performance | 5 |
|  | Medium-high performance | 4 |
|  | Medium performance | 3 |
|  | Medium-low performance | 2 |
|  | Low performance | 1 |

8.2.1. Goal 1 - Improve Mobility and Accessibility

Mobility and accessibility benefits were judged based on six objectives that were analyzed using eleven evaluation measures. The key differentiators of this goal were found to be total riders, accessibility, and daily transit riders from zero car households for the following reasons:

- Ridership estimates are an important indicator of the number of people a transitway will serve. The Federal Transit Administration (FTA) uses ridership to assess mobility benefits generated by a project to help inform funding decisions.
- Accessibility measures the total acres of land that are available within a 5 minute walk of stations. While ridership modeling uses a technical, complex methodology to estimate the number of transitway users, this accessibility measure assesses the opportunities and physical barriers that exist to riders accessing adjacent amenities at stations.
- A measure of daily transit riders from zero car households indicates how many users depend on transit and other non-auto modes to satisfy their transportation needs. Transit dependent riders are given a double-weighting over other riders in the new FTA funding criteria used to evaluate mobility benefits.

Table 25 summarizes the evaluation level findings for Goal 1. **Figure 27** provides the final composite scores for each objective based on the evaluation measures, with the key differentiators highlighted in green.

Table 25 - Summary of Goal 1 Evaluation Level Findings

| | Robert Street Arterial BRT | | Robert Street Modern Streetcar | | TH 52 Highway BRT | |
|--|----------------------------|--|--------------------------------|--|-------------------|--|
| Average Project Weekday Boardings | 3,100 | | 3,000 | | 2,300 | |
| Population within ½ Mile of Stations | 26,160 | | 27,710 | | 14,360 | |
| Employment within ½ Mile of Stations | 58,510 | | 59,730 | | 35,090 | |
| Activity Centers within ½ Mile of Stations | 1 | | 1 | | 1 | |
| Intersection Density (Intersections per Acre within 1/2 Mile of Stations) | 0.16 | | 0.16 | | 0.14 | |
| Accessibility (Acres within a 5 Minute Walkshed from Stations) | 962 | | 1,131 | | 426 | |
| Lineal Feet Bicycle and Pedestrian Facilities within 1/2 Mile of Stations | 431,484 | | 454,856 | | 160,905 | |
| Number of East-West Connections Created | 0 | | 0 | | 0 | |
| Transit Trips from Zero Auto Households | 2,000 | | 1,800 | | 1,000 | |
| Reverse Commute Trips | 1,300 | | 1,200 | | 1,100 | |
| Average Daily Off-peak Trips | 1,200 | | 1,200 | | 800 | |

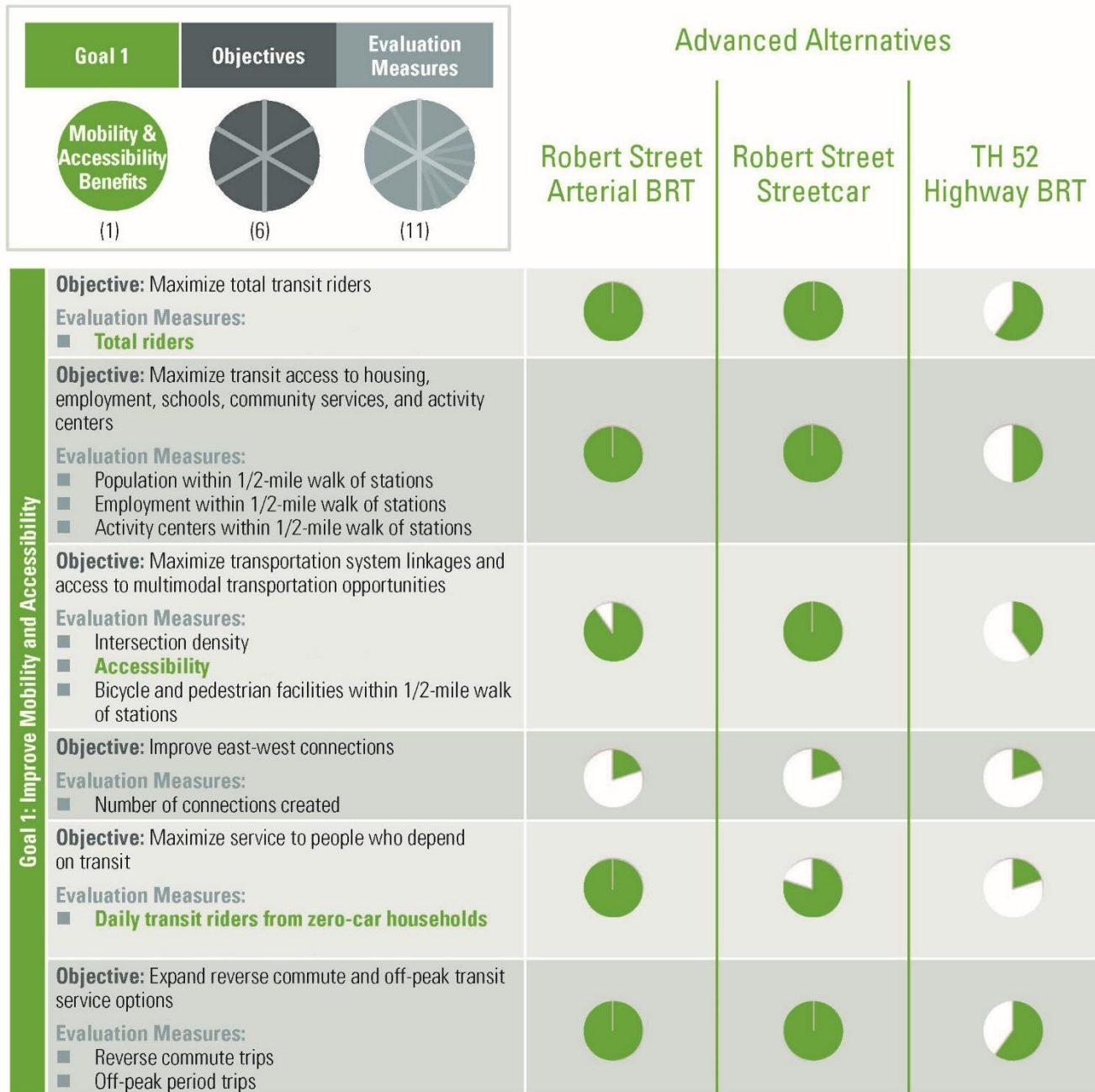


Figure 27 - Goal 1 Scores by Objective

8.2.2. Goal 2 - Enhance the Effectiveness of Transit Service Within the Corridor

Enhancement to the effectiveness of transit service within the corridor was judged on four objectives that were analyzed using one evaluation measure per objective. The key differentiators of this goal were found to be new transit riders and passengers per revenue hour of service for the following reasons:

- New transit riders account for riders that are shifting to transit from another mode of transportation. These are riders new to the transit system, which indicates increased overall system ridership and reductions in vehicle miles traveled.
- The "passengers per revenue hour of service" measure is calculated by dividing annual system riders by the total hours of revenue service in a year. Revenue service is any time a transit vehicle is in operation and available for passenger service. This measure takes into account every vehicle trip made in a given year and provides an indication of system productivity.

Table 26 summarizes the evaluation level findings for Goal 2. **Figure 28** provides the final composite scores for each objective based on the evaluation measures, with the key differentiators highlighted in green.

Table 26 - Summary of Goal 2 Evaluation Level Findings

| | Robert Street Arterial BRT | | Robert Street Modern Streetcar | | TH 52 Highway BRT | |
|--|----------------------------|--|--------------------------------|--|-------------------|--|
| Average Daily New Transit Riders | 400 | | 400 | | 800 | |
| Average Daily Passengers per Revenue Hour of Service | 52 | | 48 | | 35 | |
| Daily User Benefit Hours | 201 | | 204 | | 555 | |
| Park & Ride Capacity and Availability | 1 | | 1 | | 1 | |

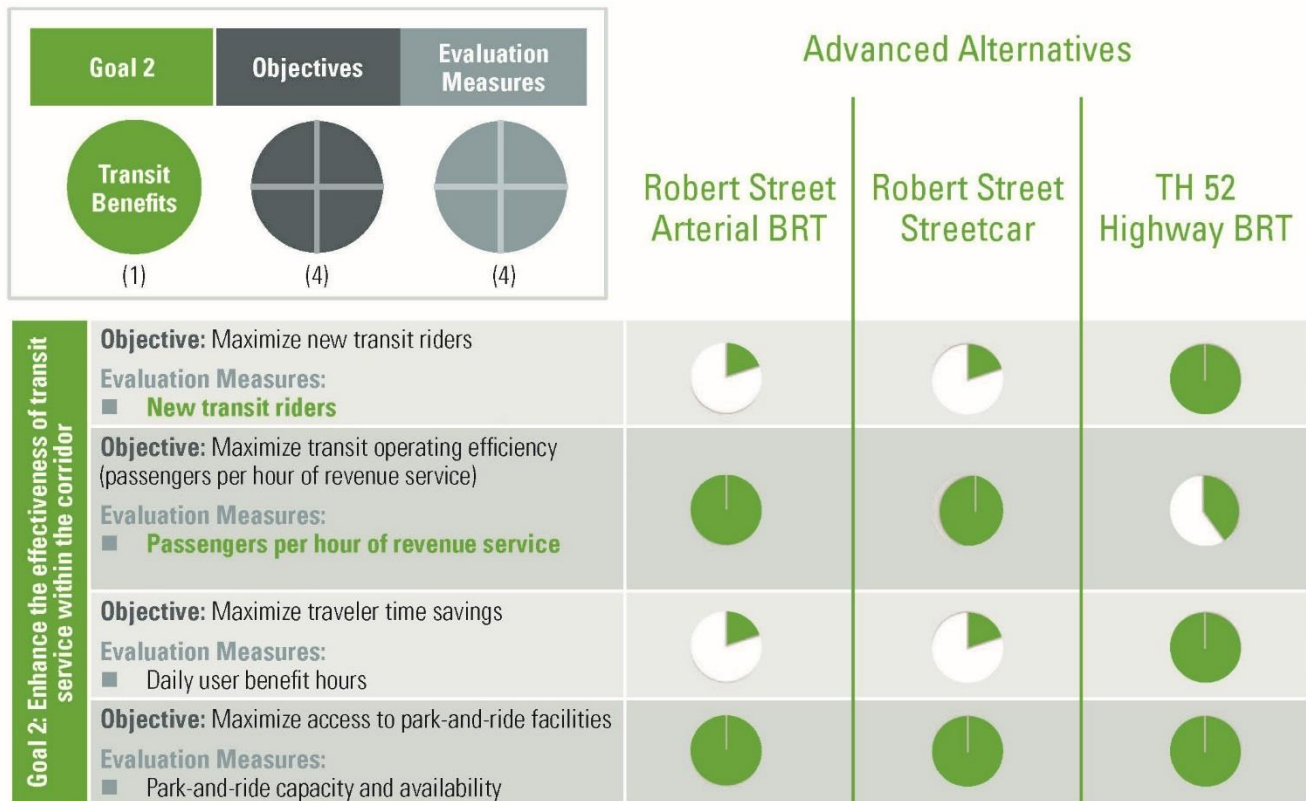


Figure 28 - Goal 2 Scores by Objective

8.2.3. Goal 3 - Provide Cost-Effective and Financially Feasible Transit Solutions

The ability of an alignment to provide cost-effective and financially feasible transit solutions was judged on two objectives that were analyzed using two evaluation measures per objective. The key differentiators of this goal were found to be capital costs and cost per rider for the following reasons:

- Capital cost estimates account for the physical system elements and labor necessary to launch a new transitway. Engineering assumptions—like station sizes, amenities, and right-of-way needs—are taken into consideration. Capital costs indicate the amount of funding required to bring an Alternative from planning to operations.
- Cost per rider is a measure calculated from annual operating costs and ridership. It provides indication of the long-term (post-construction) cost and value of the system.

Table 27 summarizes the evaluation level findings for Goal 3. **Figure 29** provides the final composite scores for each objective based on the evaluation measures, with the key differentiators highlighted in green.

Table 27 - Summary of Goal 3 Evaluation Level Findings

| | Robert Street Arterial BRT | | Robert Street Modern Streetcar | | TH 52 Highway BRT | |
|---|----------------------------|--|--------------------------------|--|-------------------|--|
| Total Project Capital Cost (2013\$) | \$27,479,000 | | \$373,064,000 | | \$46,089,000 | |
| Total Annual Operations and Maintenance Costs (2012\$) | \$4,073,000 | | \$8,269,000 | | \$3,420,000 | |
| 2030 Projected Annual Revenue | \$1,026,100 | | \$993,000 | | \$761,300 | |
| Operations and Maintenance Costs per Annual Rider | \$3.97 | | \$8.33 | | \$4.49 | |

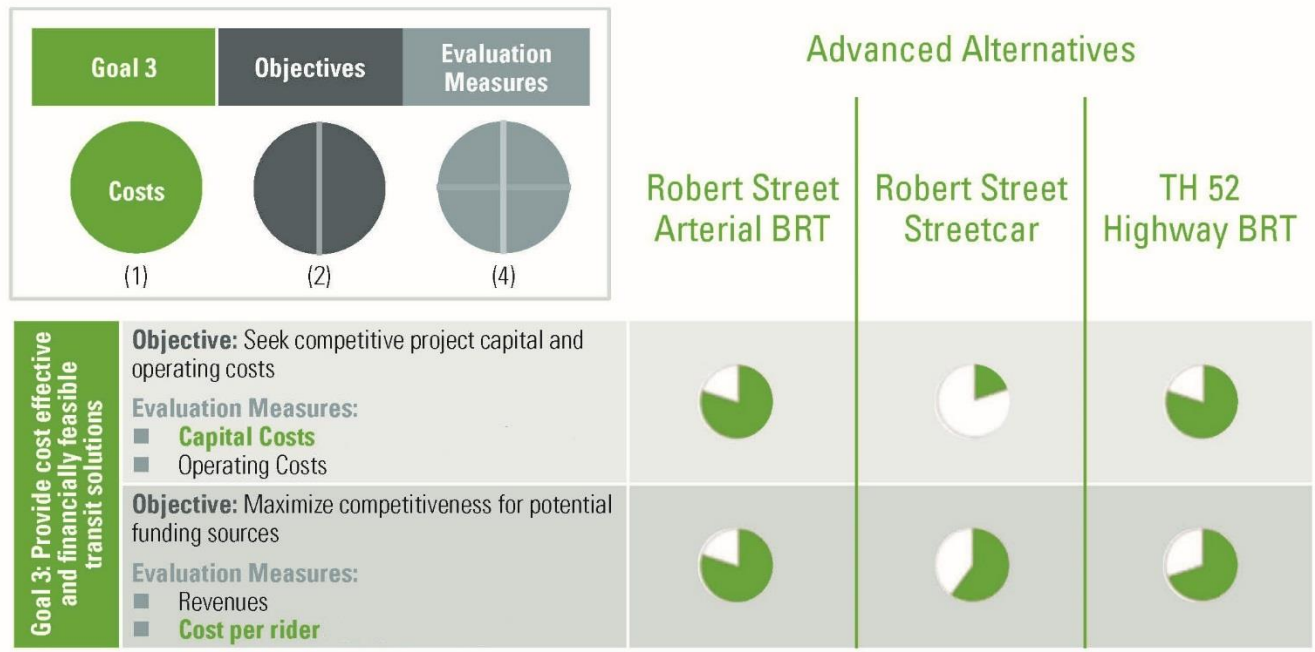


Figure 29 - Goal 3 Scores by Objective


















8.2.4. Goal 4 - Support and Enhance Existing Communities and Planned Development

The ability of an alignment to support and enhance existing communities and planned development was judged on three objectives that were analyzed using six evaluation measures. All cities through which alternatives travel include language in their comprehensive plan that mentions a transitway and supports transit-oriented development (TOD). However, the Robert Street alternatives do have an advantage over TH 52 Highway BRT due to more instances of planned development and redevelopment, as well as planned areas for mixed-use, high-density development, and walkable areas. Following an initial analysis of existing and documented opportunities, policies, and efforts to encourage development and redevelopment, it was determined necessary to conduct a more detailed economic development analysis on the two Robert Street alternatives to identify differences based on mode.

Based on national research, local experience with development along the METRO Blue and Green LRT lines, and a survey of local developers, two different real estate development scenarios were developed. It was estimated that while arterial BRT on Robert Street could help support up to \$80 million of additional residential, office, and retail development on the corridor, a local preference for rail-based modes suggests that streetcar may help support up to \$170 million of additional real estate development, or \$90 million of additional development over arterial BRT. Additional details are provided in the report **Market Potential and Transit Enhancement for the Robert Street Transit Alternatives Analysis**.

Table 28 summarizes the evaluation level findings for Goal 4, and **Figure 30** provides the final composite scores for each objective based on the evaluation measures.

Table 28 - Summary of Goal 4 Evaluation Level Findings

| | Robert Street Arterial BRT | | Robert Street Modern Streetcar | | TH 52 Highway BRT | |
|--|----------------------------|---|--------------------------------|---|-------------------|---|
| Comprehensive Plan Includes TOD Supportive Language | 2 |  | 2 |  | 2 |  |
| Acres of Soft Sites within ½ Mile of Stations | 609 |  | 626 |  | 333 |  |
| Acres of Active Tax Increment Financing use within ½ Mile of Stations | 311 |  | 313 |  | 123 |  |
| Acres of Planned Land Use Identified as Mixed-Use, High Density Residential, or Medium Density Residential | 425 |  | 450 |  | 84 |  |
| Average Station "Walk Score" | 73 |  | 72 |  | 42 |  |
| Real Estate Development Potential Score (1-5) | 2 |  | 5 |  | - | - |

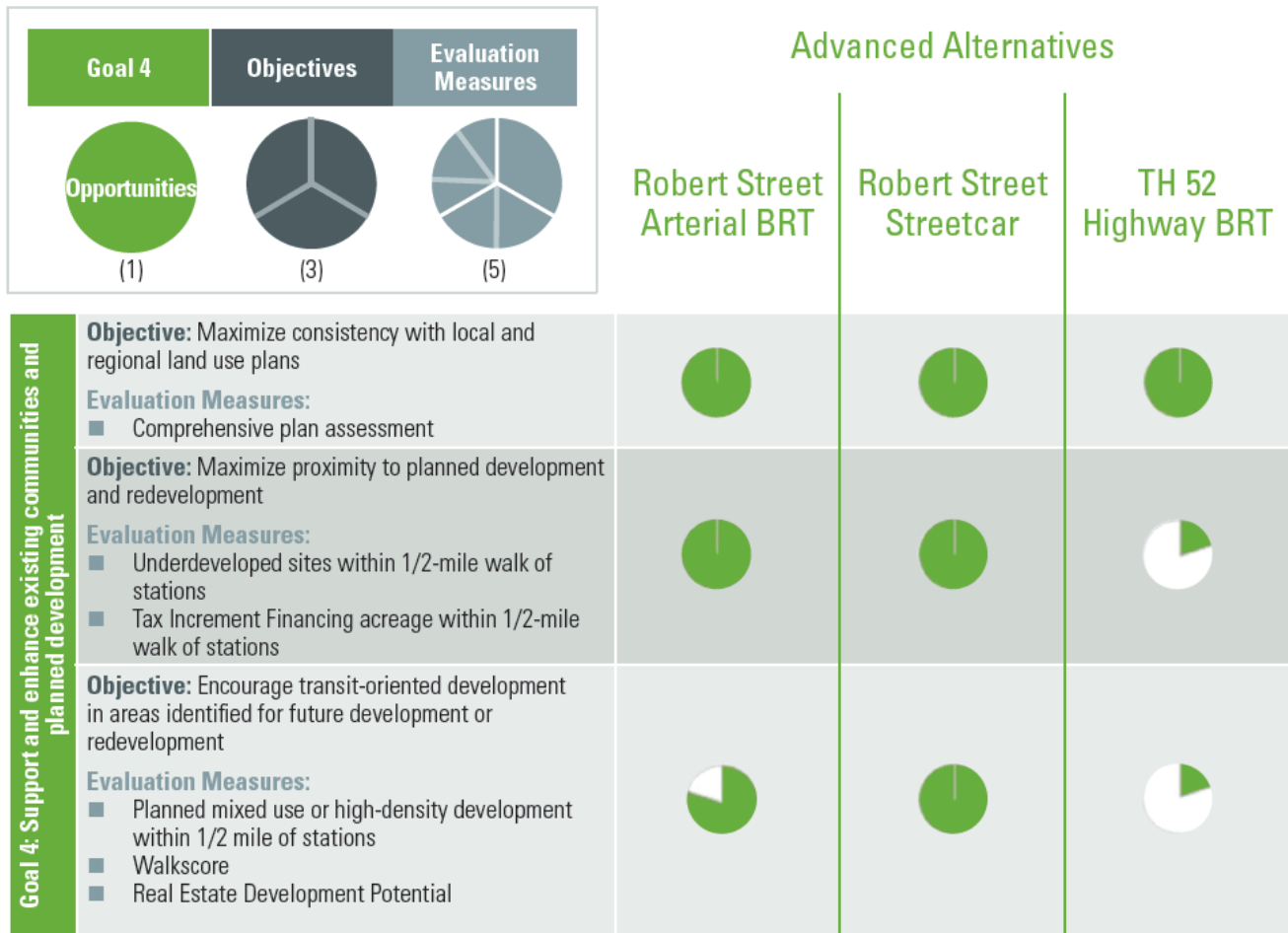


Figure 30 - Goal 4 Scores by Objective

8.2.5. Goal 5 - Support Healthy Communities and Sound Environmental Impacts

The ability of an alignment to support healthy communities and sound environmental impacts was judged on seven objectives that were analyzed using eight evaluation measures. Like goal 4, it was determined that there is no one key differentiator that captures all of the opportunities associated with each Alternative. As could be expected when reviewing issues such as community resources, environmental justice (EJ), and water resources; where more resources exist, a greater potential for impacts exist.

Table 29 summarizes the evaluation level findings for Goal 5, and **Figure 31** provides the final composite scores for each objective based on the evaluation measures.

Table 29 - Summary of Goal 5 Evaluation Level Findings

| | Robert Street Arterial BRT | | Robert Street Modern Streetcar | | TH 52 Highway BRT | |
|--|----------------------------|--|--------------------------------|--|-------------------|--|
| Acres of Proposed ROW Acquisition | 0.04 | | 3.06 | | 2.7 | |
| Property Access and Parking Losses | 143 | | 134 | | 0 | |
| Total Number of 2030 Vehicles Impacted During Peak Hour | 800 | | 1,300 | | 0 | |
| Total Historical Resources within 500 feet of Alignment or ¼ Mile of Stations | 215 | | 202 | | 87 | |
| Noise and Vibration Receptor Parcels within 500' of Alignment | 812 | | 803 | | 858 | |
| Percentage of Block Groups within ½ Mile of Alignment that Qualify as EJ ¹⁶ | 78% | | 78% | | 80% | |
| Acres of Wetlands within 500' of Alignment | 15 | | 15 | | 53 | |
| 2030 Average Daily Reduction in Vehicle Miles Travelled | 5,700 | | 5,500 | | 10,900 | |

¹⁶ EJ block groups included those with a higher percentage (compared to the county average) of low income (less than 150 percent of the poverty line) or minority residents (non-white or Hispanic).

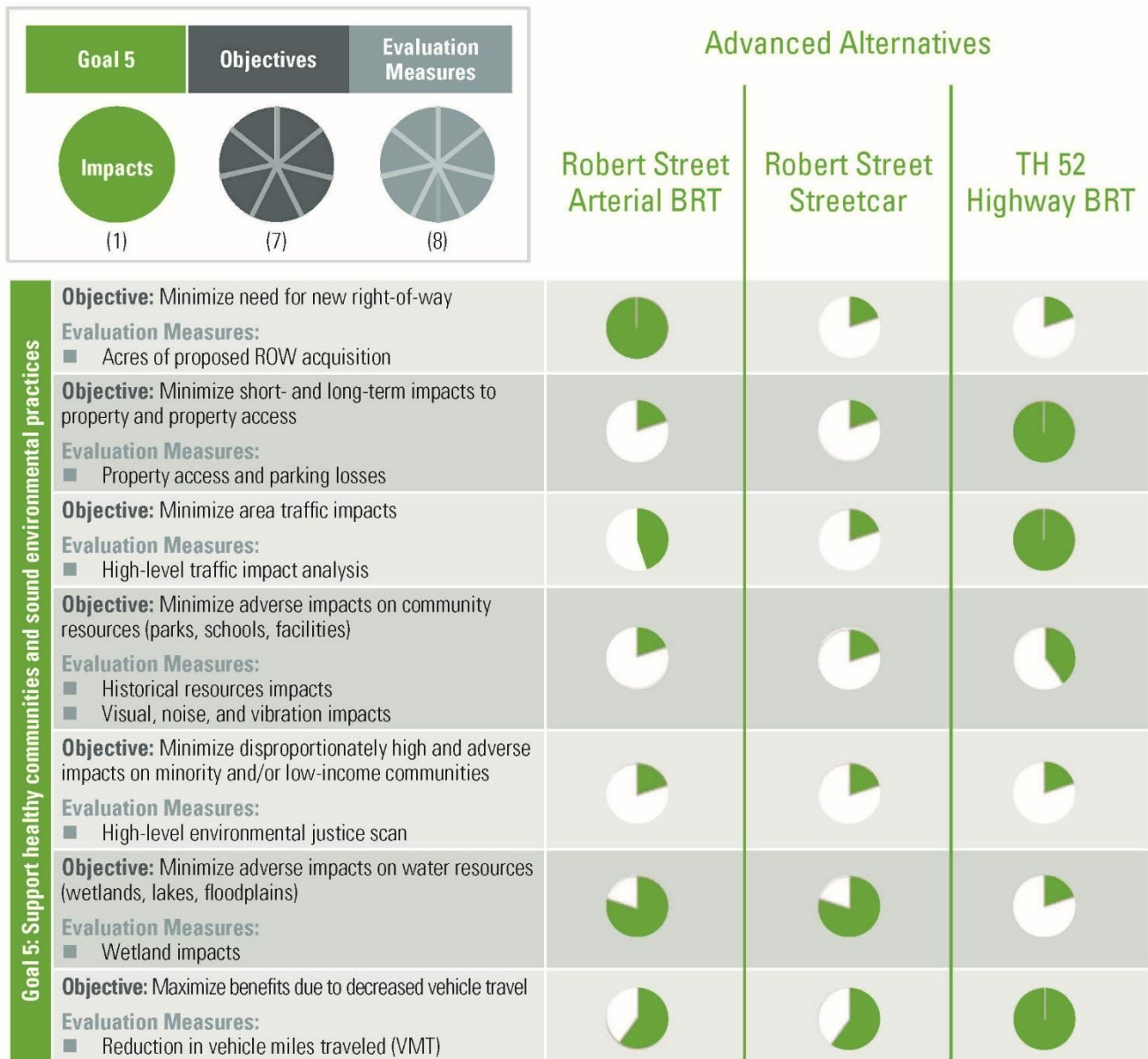

















Figure 31 - Goal 5 Scores by Objective

8.3. Final Summary

The results of the final Alternatives evaluation of are provided in **Table 30**.

Table 30 - Summary of Evaluation Results

| Evaluation Measures | Alternatives | | |
|--|---|--|---|
| | Robert Street Arterial BRT | Robert Street Modern Streetcar | TH 52 Highway BRT |
| Mobility & Accessibility Benefits <i>Goal 1: Improve mobility and accessibility</i> |  |  |  |
| Transit Benefits <i>Goal 2: Enhance the effectiveness of transit service within the corridor</i> |  |  |  |
| Costs <i>Goal 3: Provide cost effective and financially feasible transit solutions</i> |  |  |  |
| Opportunities <i>Goal 4: Support and enhance existing communities and planned development</i> |  |  |  |
| Impacts <i>Goal 5: Support healthy communities and sound environmental impacts</i> |  |  |  |
| Overall Ranking <i>Goal 1 + 2 + 3 + 4 + 5</i> |  |  |  |

9. Locally Preferred Alternative(s) Recommendation and Next Steps

9.1. Steering Committee Decision

The technical recommendation and results of public input were brought to the Steering Committee for consideration in April 2014. While the Robert Street Arterial BRT Alternative rated the highest based on the technical evaluation measures, cost was one of the few key separators between the Robert Street Modern Streetcar and Robert Street Arterial BRT Alternatives. At the conclusion of the technical analysis, many of the project stakeholders expressed an interest in revisiting the land use assumptions and development potential for arterial BRT and modern streetcar. Additional economic development analysis was conducted, but an interest remained to revisit comprehensive planning efforts to further refine achievable increases in densities on Robert Street. Furthermore, the Saint Paul Streetcar Study recommended modern streetcar on a shorter segment of Robert Street from the Union Depot to Cesar Chavez and State St. in the West Side neighborhood. Therefore, a need was identified for Saint Paul and West St. Paul to coordinate on the long term vision for transit in the Robert Street corridor.

Due to the continued interest in the Robert Street Modern Streetcar Alternative, the Steering Committee recommended delaying the advancement of a single LPA at the conclusion of the AA. This decision was made to allow more time to conduct additional land use planning, update comprehensive plans to guide development within the corridor, and make targeted capital investments to encourage additional density within the corridor. Due to the competitive nature of federal programs, demonstrated commitment to transit-supportive densities within the Robert Street corridor will be especially important in the New Starts/Small Starts application process, if this is targeted as one of the funding channels.

Based on these considerations, the Steering Committee recommended a two-part conclusion to the AA.

- **Conclude the AA without an LPA and carry forward the two strongest options for further study, including:** Robert Street Arterial BRT and Robert Street Modern Streetcar
- **Other Recommendation:** begin assessment of traditional express service on TH 52

Following the conclusion of the AA, the Steering Committee also supported a staff recommendation that West St. Paul and Saint Paul conduct a workshop or series of workshops to establish a vision for transit-oriented development within the Robert Street corridor. This process would aid in establishing goals, setting targets for growth, and scheduling milestones to achieve this vision. Transit-supportive policies would likely have the strongest influence on development as well as overall ridership within the corridor, and the selection of mode will follow this key process.

9.2. Resolutions of Support

Seven of the eight corridor cities with representation on the Steering Committee submitted a resolution of support for the evaluation process conducted by the AA. Five of these cities also included a resolution of support to carry forward both BRT and streetcar alternatives, while both West St. Paul and South St. Paul only supported carrying forward the BRT alternative. Rosemount provided a letter acknowledging the study and the findings, but did not submit a resolution of support, noting that it would be inappropriate for the Rosemount

City Council to choose a preferred alternative because the final alternatives do not directly provide transit service to Rosemount.

- *Resolution of support for the evaluation process conducted by the AA and its conclusions, and support to conclude the AA with two alternatives that will be carried forward for consideration in further study:*
 - City of Eagan
 - City of Inver Grove Heights
 - City of Mendota Heights
 - City of Saint Paul
 - City of Sunfish Lake
- *Resolution of support for the evaluation process conducted by the AA, and support to carry forward the BRT alternative only:*
 - City of South St. Paul
 - City of West St. Paul
- *Letter acknowledging study*
 - City of Rosemount

9.3. Public Comment Period

Following the completion of the Draft Final Report, a public comment period was held from July 28th, 2015 through September 11th, 2015. No comments were received during this period.

9.4. Implementation Plan

9.4.1. LPA Adoption Process

The Steering Committee advances two alternatives—Robert Street Arterial BRT and Robert Street Modern Streetcar—from the AA into the next phase of project development. Given that the AA concluded in early 2015, an opportunity exists to align future corridor planning efforts with updated 2040 forecasts as well as Comprehensive Plan updates that will take place between 2016 and 2018. Final selection of an LPA will take into account updated land use assumptions, updated 2040 population and employment forecasts, the updated regional context outlined in Thrive 2040, and the funding priorities described in the 2040 TPP. **Figure 32** depicts the timeline for each alternative.

9.4.2. Funding Sources

Funding is essential for implementation of a transitway on Robert Street. While transit funding is currently scarce and competitive, there are sources of funding available at the federal, state, regional, and local levels.

9.4.2.1. Federal

The Federal Transit Administration's New and Small Starts discretionary program is the largest source of capital funds for transit. This program provides more than \$2 billion of capital funding for transit projects each year. Other federal funds that may be used for capital funding include TIGER funds, FTA Section 5303 Planning funds and CMAQ and STP funds. Most funding for streetcars currently comes from TIGER funds and CMAQ and STP funds. Locally, CMAQ and STP funds are distributed through the Metropolitan Council via their Transportation Advisory Board Regional (TAB) Solicitation for Federal Funds (see Regional discussion).

9.4.2.2. State

There are various sources through the State of Minnesota that can also be used for capital funding. These typically include funding from the state legislature or MnDOT. More specifically, the State General Fund, General Obligation Bonds and MnDOT trunk Highway Funds and Bonds can be used for funding transit projects.

9.4.2.3. Regional

There are several sources of funding at the regional scale that can be used for capital and operational funding. These include the motor vehicle sales tax, regional transit capital bonds, and the TAB Regional Solicitation for Federal Funds, which are all administered by the Metropolitan Council. Thus far, the Metropolitan Council has been supportive of funding arterial BRT but is still in the process of developing a policy regarding streetcars. The Counties Transit Improvement Board is also a source of regional transit funding. Currently, CTIB's framework for funding does not include funding streetcars. CTIB's Phase I Program of Projects includes Robert Street if arterial BRT is chosen as the locally preferred alternative.

9.4.2.4. Local

Local municipalities can also provide funding through the creation of Tax Increment Financing (TIF) districts, special assessment districts, and other fees and taxes. Cities and counties can also use their general funds for transit projects as they see fit. Regional Railroad Authority property taxes are another source of regional funding and are administered by the county regional railroad authorities.

9.4.3. **Local Precedent for BRT and Streetcar Funding**

The first arterial BRT route in the region, the A-Line on Snelling Avenue, currently under construction, is funded through a variety of sources. These sources include federal grants and bonds, bonds and general funds from the State of Minnesota, and local funding sources.

The Nicollet-Central Streetcar in Minneapolis has not been fully funded at this point. In 2010, the City of Minneapolis completed the "Minneapolis Streetcar Funding Study" and identified probable sources of funding for streetcars in Minneapolis. These sources included increases in parking meter fees and a surcharge on public and commercial parking spaces, city tax abatement related to future development and future increases in property value caused by the streetcar, special assessments within the a streetcar benefit district, revenues from fares, bulk user agreements, and advertising or naming rights.

Thus far, the City of Minneapolis has created a Value Capture District, from which it anticipates collecting \$60 million. This district is different than a typical TIF district because only certain properties are included in the district rather than the district being composed of the area along the entire transit corridor. Additionally,

rather than using tax revenues that result from the transit project, this district is capturing the increases in property taxes before and after the project since development has already started.

Local funding sources are currently the primary funding source for streetcar projects. Approximately 70 percent of the Cincinnati streetcar, 50 percent of the Seattle streetcar, and just under 50 percent of the Tucson streetcar were funded with local sources. These projects utilized local improvement districts, TIF resources, other development revenue, property and income taxes, revenue from public utilities, local grants, private funding, and the sale of land¹⁷. While the City of Minneapolis created a special assessment district focused on only a few properties for the Nicollet-Central Streetcar, a broader special assessment district or TIF district could be used to fund a streetcar on Robert Street. TIGER, CMAQ, and STP funds are also frequently used for streetcar funding in other parts of the country, but the Metropolitan Council would need to change their policies in order to use CMAQ and STP funds for streetcars locally. The use of CTIB and Regional Rail Authority funds for a streetcar on Robert Street would also require policy changes by these organizations.

9.4.4. Next Steps

The next steps for this corridor include an assessment of land use within the Robert Street corridor, followed by the selection of an LPA. After the LPA is selected the process is dependent on whether streetcar or arterial BRT is chosen for the corridor, as shown in **Figure 32**.

¹⁷ <http://www.cincinnati-oh.gov/streetcar/streetcar-funding/>
<http://www.seattlestreetcar.org/about/docs/faqCosts.pdf>
<http://www.sunlinkstreetcar.com/index.php?pg=5>

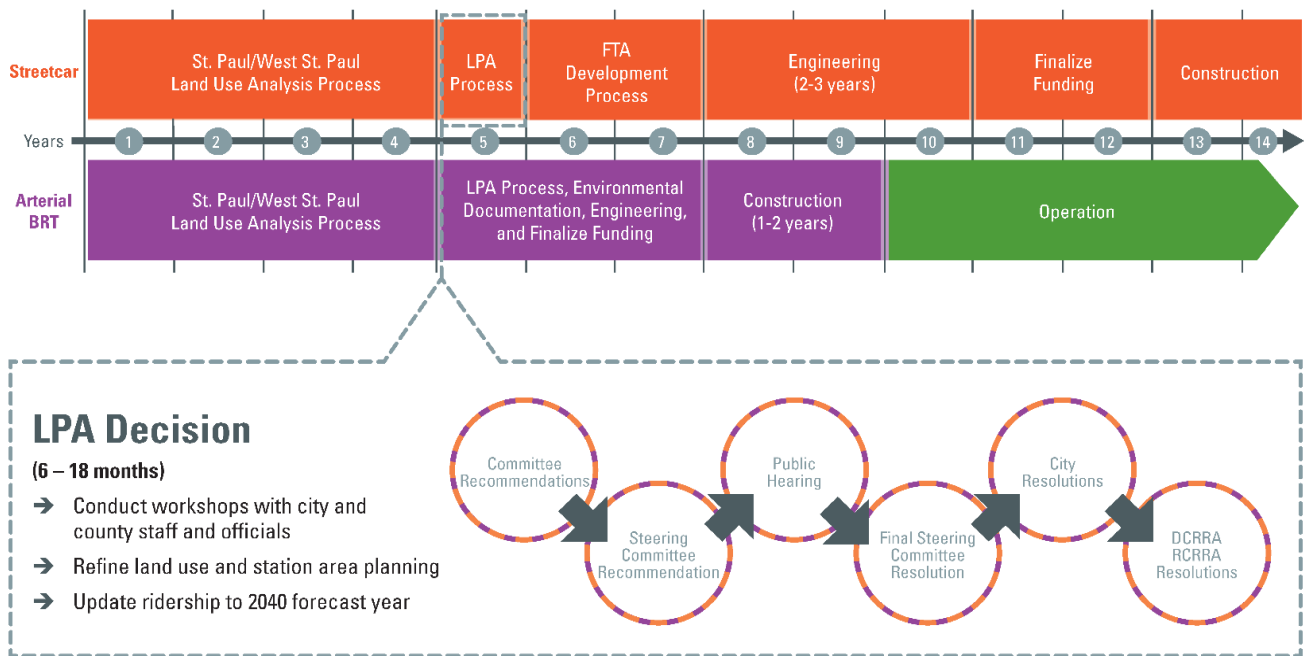


Figure 32 - Implementation Process